

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

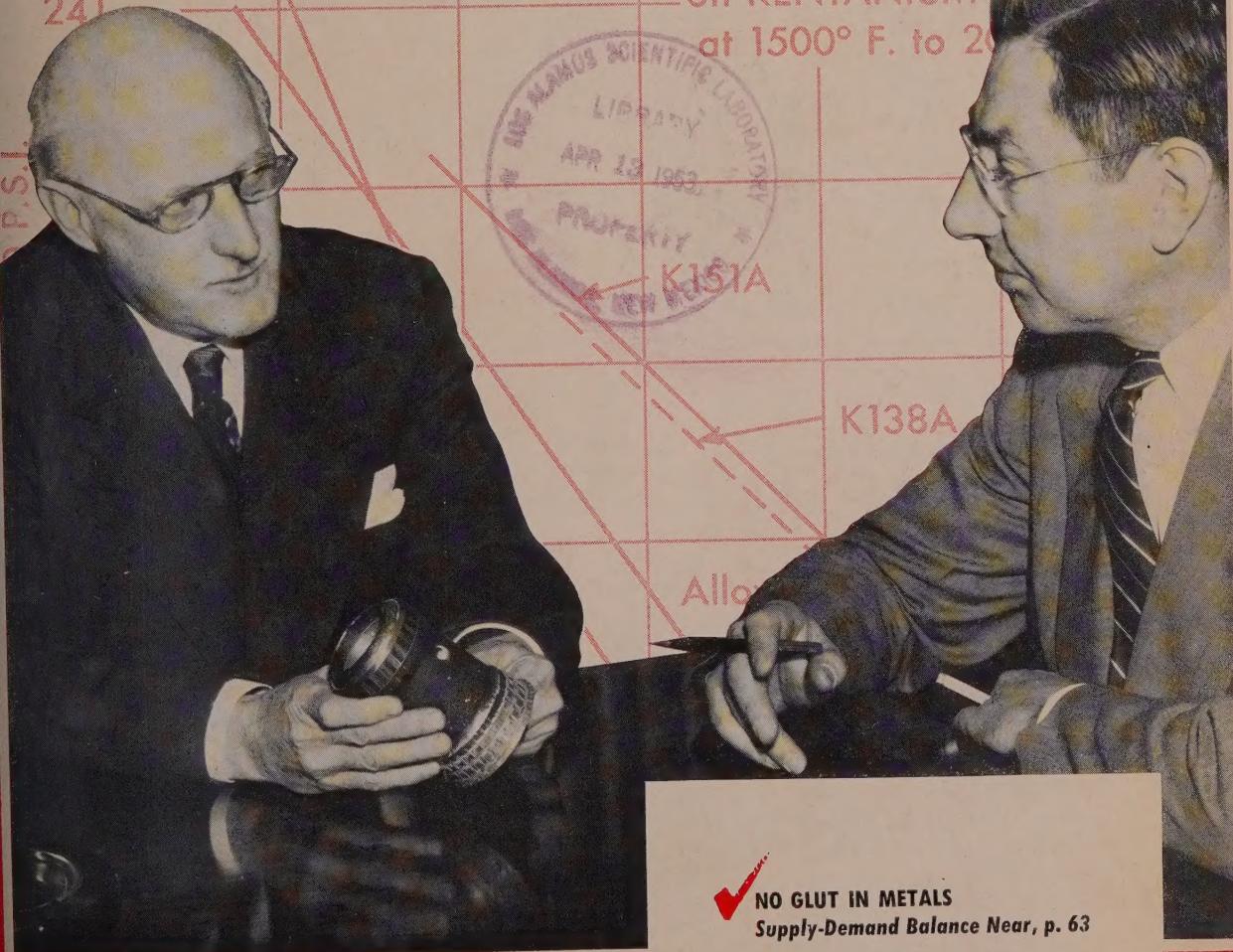
28

Research Brings Results

John Redmond (right), with Kennametal President Philip McKenna, shows how—p. 74

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Rupture Stresses
on KENTANIUM
at 1500° F. to 2000° F.



NO GLUT IN METALS

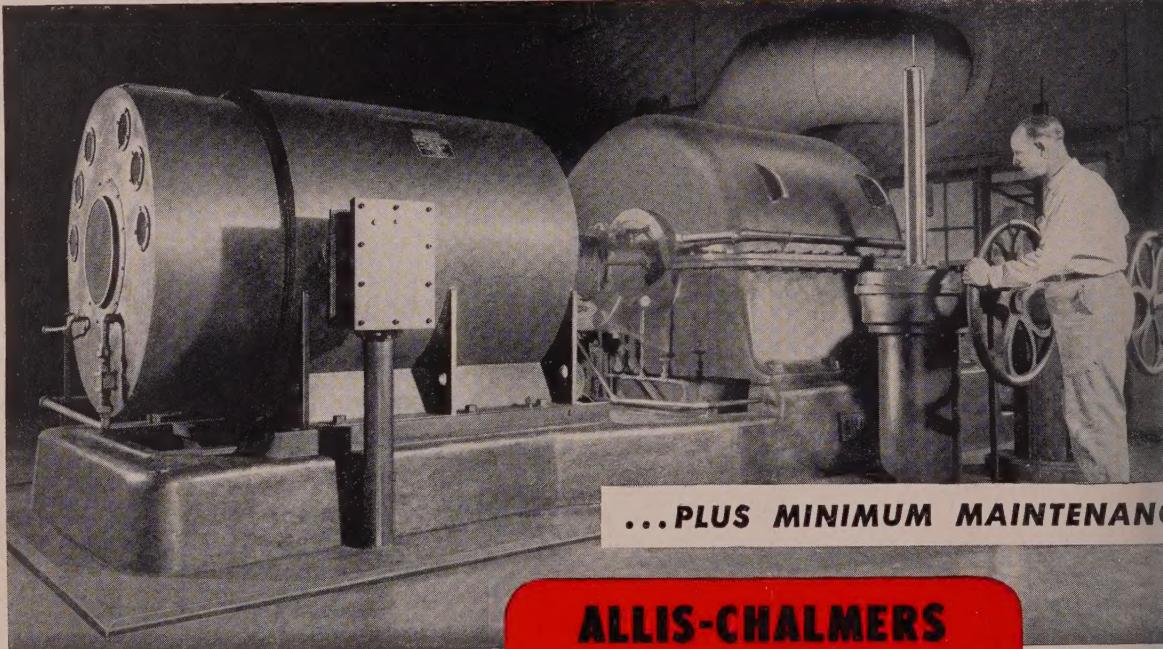
Supply-Demand Balance Near, p. 63



DUAL FREQUENCY HEATING

It's Practical for Forging, p. 140

YOU CAN HAVE Size... AND Safety TOO



...PLUS MINIMUM MAINTENANCE

1250-hp, 3575-rpm motor driving compressor.

A few years ago, explosion-proof motors were limited to small sizes — because there was no practical way to cool large totally-enclosed fan-cooled motors. Allis-Chalmers ended that limitation with the introduction of *tube-type* air-to-air heat exchanger construction in 1946.

Tube-type construction makes both large sizes and minimum maintenance possible because it provides:

- 1. Full internal air circulation** plus *circumferential tube distribution* . . . to assure efficient, even cooling of motor.
- 2. Complete enclosure** . . . to protect stator core and other electrical parts from both dirt and corrosion.
- 3. Self-cleaning action** . . . result of generous flow of outside air through smooth, straight heat exchanger tubes.

ALLIS-CHALMERS Tube-Type TEFC MOTORS

RATINGS AVAILABLE

Both standard and explosion-proof TEFC motors are built with *tube-type* construction in ratings from 40 hp at 600 rpm to several thousand horsepower. Ratings up to 800 hp at 3600 rpm are available with Underwriters' labels.

PROVED IN OPERATION

In sizes from 250 to 2500 hp alone, purchases of these *tube-type* motors total more than 215,000 hp. For more information about these motors that have been proved in operation indoors and out, call in your nearby A-C representative or write for Bulletins 51B7149 (*it's new*) and 05B7150, Allis-Chalmers, Milwaukee 1, Wis. A-3669



ALLIS-CHALMERS

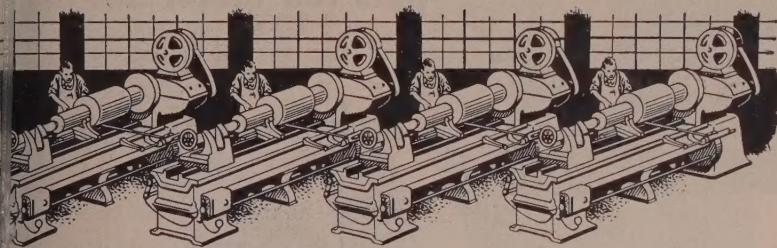


Tool Steel Topics



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



Output up 150 pct with Red Sabre Bits

Four identical lathes, side by side, produced identical parts in one of our customer's shops. Using both high-speed and carbide tool bits, the rate per part was set at 150 pieces per machine by the time-study engineers.

One of the lathe operators heard about Red Sabre tool bits from a friend. So he brought one to work and began using. He surprised himself by finishing 325 pieces in one shift, earning a nice bonus. When he kept up his high rate, the payroll department began to ask questions. But a check-up showed that the operator's production was being reported correctly. In fact, his output increased to an average of 370 pieces.

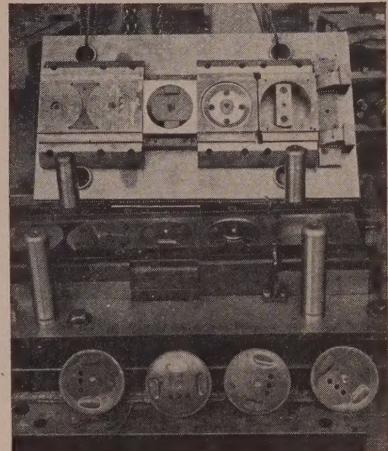
When the time-study men got to the

bottom of the mystery they really became enthusiastic. Red Sabre bits were installed on all four lathes. Output reached as high as 400 by increasing speeds and feeds.

Red Sabre bits are mighty popular in this shop because both the machine operators and the management are reaping the benefits of the increased output.

Red Sabre is our super high-speed steel. It has more wear-resistance and higher red-hardness than run-of-the-mill tool bits. Red Sabre tool bits, hardened to a minimum of Rockwell C-65 and ground accurately, are available in all standard sizes.

Like to try them in your shop? Order a couple from us at Bethlehem, Pa., or ask your distributor about a trial.



HIGH-PRODUCTION DIE

This blanking, drawing, and forming die is made of high-carbon, high-chromium tool steel (our Lehigh H) to make possible long production runs. Operated in a 350-ton press, it produces end caps for a refrigeration unit. Hardened to Rockwell C-60, this die turns out about 100,000 pieces from 3/16-in. steel strip before redressing is needed. An air-hardening grade of tool steel, Lehigh H provides very high wear-resistance and the least amount of distortion during heat-treatment.

BETHLEHEM TOOL STEEL

ENGINEER SAYS:



Remedy those
fatigue-failures

Tools such as chisels, that are subjected to repeated stresses, often fail suddenly. As the tools are made from shock-resisting steel, these sudden failures can look mysterious. But close examination of the failed parts will often reveal that the failures were actually not sudden but occurred by progression of a crack part way through the section, followed by sudden fracture of the remaining section.

Fatigue-failures have a characteristic, smooth-rubbed surface where the initial crack opened up, and an inner crystalline zone revealed by the final sudden break. Often the smooth-rubbed surface shows parallel "oyster-shell" markings, and may even show evidence of rusting.

Fatigue-failures usually begin at a stress-concentration point. This may be a notch, a poor fillet, tool mark, accidental nick, or a stamping. Correcting such design or mechanical faults is the cure.



(Left) A kitchen-ware maker uses BTR* for the die that blanks and draws .032-in. aluminum to accurate size. The fit between the die halves is held to close tolerance to assure proper flow of metal during the one-stroke draw and to produce a smooth surface. This die has produced more than half a million pieces.

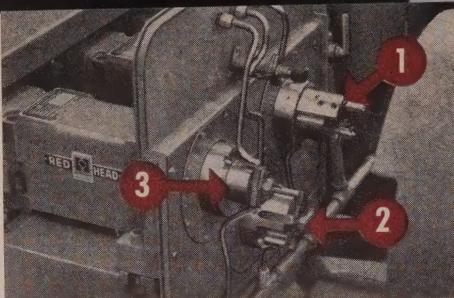


(Right) In a single operation these piercing dies, made of our BTR* tool steel, put 125 holes in the aluminum accessory for pressure cookers shown at the right. The punches were excellent alignment after heat-treatment, and showed little evidence of wear after producing 165,000 pieces without requiring regrinding.

* is an economical, general-purpose tool steel. Hardening, it's easy to machine and heat-treat. High and wear-resisting, it's low in distortion.

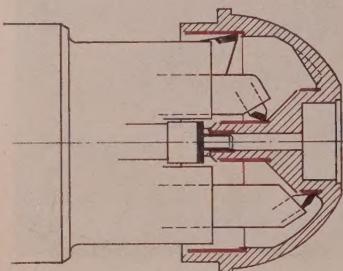
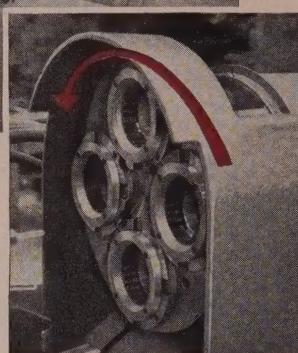
ROTARY INDEXING

puts fan-motor housings
on a
high production basis



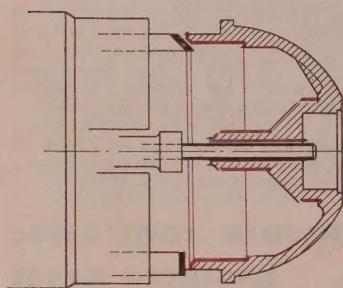
The three multiple-tool boringhead stations shown above perform a variety of precision finishing operations on eight different surfaces of fan motor end frames. Small cylinder at top station is an unloading ejector.

The workholding fixture shown at the right is rotated in 90° increments, presenting parts to each of the three boringhead stations in proper sequence, as indicated below.



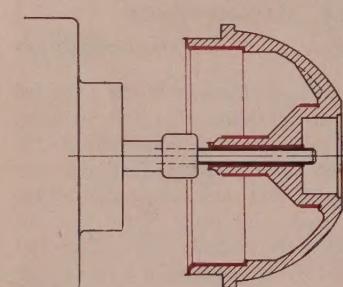
STATION 1.

Bore, turn two diameters, face shaft end and start reaming of center hole.



STATION 2.

Face and chamfer end of frame — rough ream full length of center hole.



STATION 3.

Finish ream center hole.

Heald Model 221 Bore-Matic bores, reams, turns, faces and chamfers motor end frames in continuous, consecutive cycle

• Here's another example of how Heald engineering found the answer to a high precision multiple borizing problem.

By means of the four-station rotary indexing fixture shown above, parts are presented in sequence to each of three boring head work stations. The fourth station, on the top of the fixture, is used for loading and unloading.

For the long, small diameter center hole on this particular job, a reamer is used in preference to a boring tool in order to avoid chatter problems and assure a smooth, clean bore. The operations performed at each station are shown at the left. The entire machine cycle is fully automatic and parts are loaded and unloaded at the top station while the other three stations are boring. A completely finished part is brought to the unloading station at each 90° rotation of the indexing fixture.

Remember — when it comes to precision finishing, it pays to come to Heald.



Case Study
No. 2240-96 in

PRECISION
PRODUCTION

INTERNAL AND ROTARY SURFACE GRINDING MACHINES AND BORE-MATIC

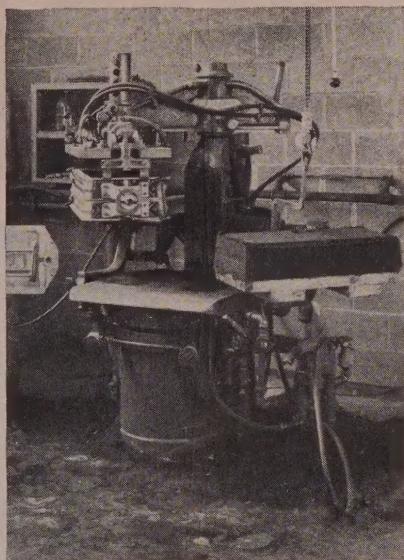
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2. Less time is needed to load uniform castings in chucks or holding fixtures. Extra grinding operations on oversized castings are eliminated.

3. Uniformity of machine rammed molds and cores reduce scrap casting losses. Machines make molds and cores faster, too.

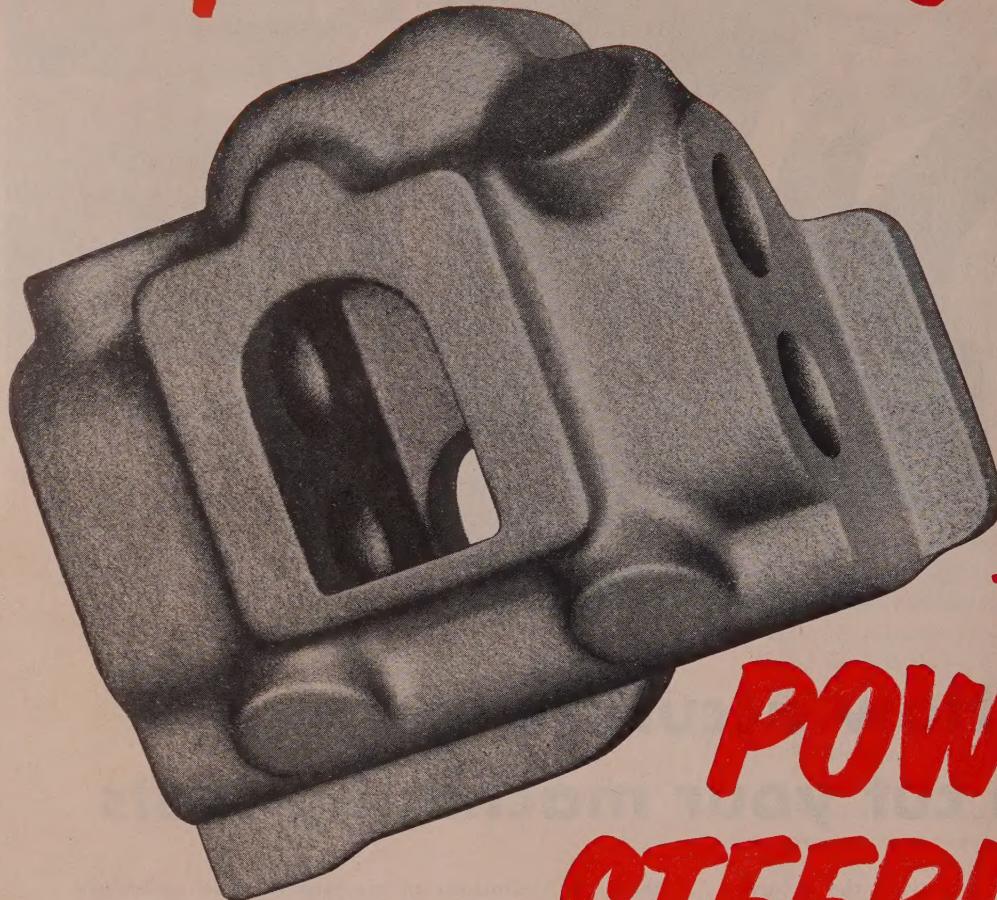
INVESTIGATE NOW. Have an Osborn foundry-trained molding specialist analyze your operations. You can profit from his long experience in improving the quality of castings . . . cutting foundry molding costs. Write *The Osborn Manufacturing Company, Dept. EE-4, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

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**This Week in
Metalworking**

STEEL

Vol. 132 No. 15

Apr. 13, 1953

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Metal Market

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Behind the Scenes...

Meet John Morgan . . .

In a particularly curious mood one day last week, we asked Marge, our telephone operator, to tell us which of our editors receives the greatest number of telephone calls . . . business calls, that is . . . during the normal working day.

"Why Mr. Morgan, of course," she answered with a toss of her pretty head.

"Mr. Morgan, eh?" we mused. "And how many calls might that be on the average?"

"Maybe 25 to 30 a day," she answered.

That was enough for us. Any guy able to stand that many phone bells ringing in his ears all day deserved to have the world know about it . . . so we went to see John Morgan, assistant managing editor of STEEL.

Found him hiding behind a pile of mail that would have done credit to Marilyn Monroe. Just for fun, we kidded him into letting us stack it up piece on piece. Then, we pulled out our expandable rule (just happened to have one with us) and reeled out two feet of it before it reached from the desk top to the top of the pile. That, Dear Reader, is mucho mail . . . and Morgan burrows through a stack just like it every day.

Now, let's wrap all this mail and a bundle of 25 to 30 telephone calls (one every 18 minutes) in a streamer of telegraph and teletype messages about ten feet long and you begin to get the picture of the daily routine load Morgan picks up each morning when he reports for desk duty.

John Morgan is well known to most STEEL readers. They follow his weekly Metalworking Outlook reports and are also familiar with his deft handling of major news stories.

Morgan is also the originator and author of those "My Day" interviews which STEEL has carried in recent months.

He has a knack for coming up with the "just right" touch in the preparation and presentation of metal-

working news stories. And than to this newsman's sixth sense and happy faculty for being able to transmit his ideas to others, John makes news story assignments. That also takes on quite a few of the assignments himself is witnessed the fact that he traveled well over 10,000 miles during 1952 searching out facts to build into stories.

Morgan came to STEEL approximately seven years ago from a position in the Advertising and Public Relations Departments of the White Motor Co. Previous to this, he attended Yale University and later tucked some graduate work from Western Reserve University under his academic belt.

John is married and daughter Penny, age 5, is the light of his life. Likes to collect records, too, with Benny Goodman and George Shearing being his particular favorites.

John Morgan is as original as the "stand-up meetings" he calls when a hot story is in the works and steady and purposeful as the daily calendar upon which he notes his schedule of stories. Yep, here's a guy who really gives you plenty of quantity along with the quality.

Shrdlu's Glossary

Perhaps you get as confused as we do on occasion by some of the terms tossed around your office from time to time, all pointed so they say toward greater business efficiency. Well . . . we doubt it just enough that we'd like to air a few of them and maybe you have a few more you'd like to add:

A Program—Any assignment that can't be completed by one telephone call.

To Expedite—To confound confusion with commotion.

Channels—The trail left by inter-office memos.

Coordinator—The guy who has a desk between two expeditors.

Consultant—Any ordinary guy more than 50 miles from home.

To Activate—To make carbons and add more names to the memo.

To Implement a Program—Hire more people and expand the office.

Shrdlu

Wellman will build it

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Ore Bridges
Gas Producer Plants
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*Wellman 17 net ton ore
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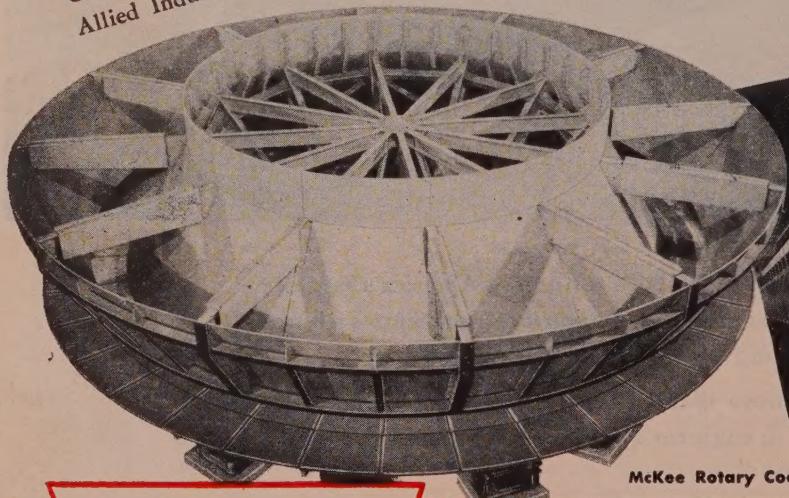
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**POLLOCK
ALSO MAKES . . .**

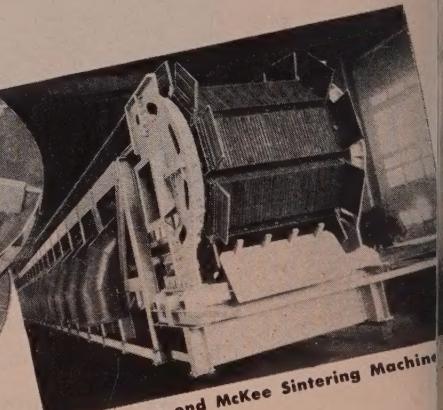
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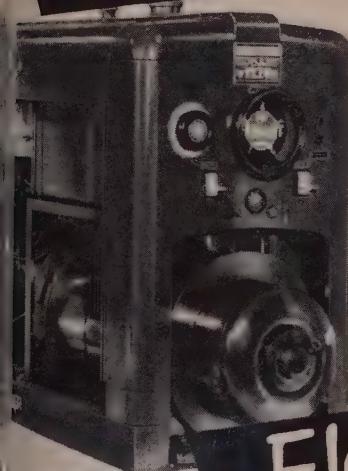
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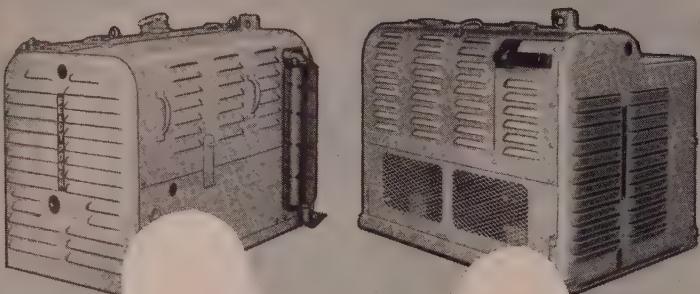


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LETTERS TO THE EDITORS

Handbook Valuable to Indus



I want to thank you very much for sending me a copy of the Specifications Handbook, published by STEEL. I believe the industry owes your magazine a great deal of thanks for the excellent job of coordinating all these various specifications. I am sure I will treasure my copy.

P. H. C. Babcock & Wilcox
Tubular Products Division
Beaver Falls, Pa.

I am very thankful to have received your Specifications Handbook. It not only becomes a valuable reference book but also a reminder that STEEL is serving their subscribers with information and data beyond that contained in the weekly issues.

William E. B.
district sales manager
Alain Wood Steel
Conshohocken, Pa.

I wish to thank you most appreciatively for my copy of STEEL's Specifications Handbook. It is certainly better than I expected when I wrote to you for a copy.

Past experience, coupled with complete chemical analyses, enables us to transfer information into machinability and is, therefore, of great value not only to myself but to the metal cutting industry.

Maynard L. L.
Engineering Department
Threadwell Tap & Die
Greenfield, Conn.

Forming Stainless Steel



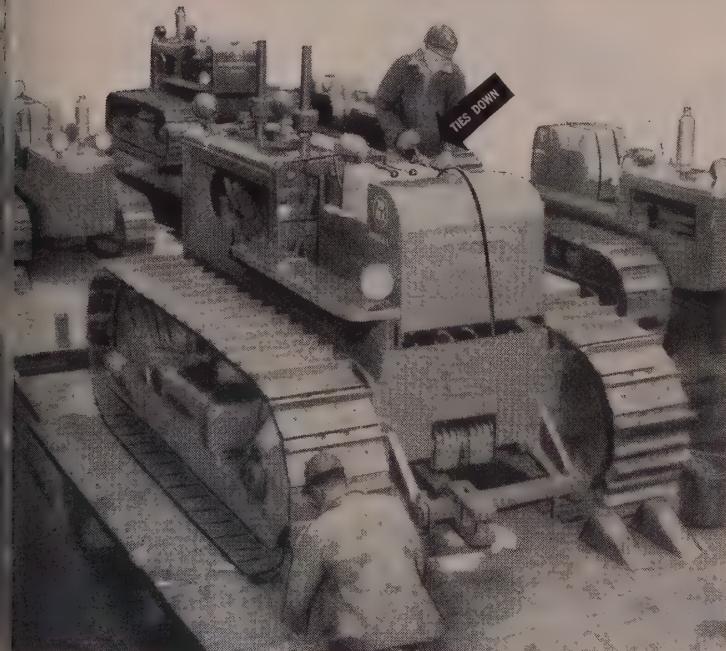
We read with interest your article "New Stainless Stretches Nickel" (May 18, p. 94), primarily because of the illustration of the forming of stainless steel as done by the Budd Co.

Robertson Q panels are sometimes built with an exterior skin of Type 430 stainless steel. Forming the exterior skin from stainless steel has presented a lubrication problem we have not yet solved. The exterior side of the skin is of open box type construction, living at right angles at each bend. Lubricants have not successfully prevented sticking of the stainless steel or picking up the sheets by the rolls. Because we have not found a lubricant that works, we buy sheets with paper pasted to each side. The paper has prevented the

Please turn to page 12

Acme Steel Strapping Insures S.A. (Safe Arrival)

**Secures tractor parts for long-distance hauling
... saves time and trouble for International Harvester**



STRAPPING ON A TRACTOR. When International Harvester ships crawler tractors on railroad flatcars, Acme Steel Strapping ties tool boxes, lubrication equipment and cushions in place for the journey.



SOLE SUPPORT for these IH Diesel engines is one Acme Steelstrap per engine. It secures the engine to a pallet for easy handling.



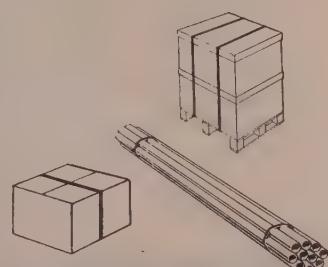
4,000 POUNDS of tractor dashboards are bundled together with Acme Steel Strapping for delivery from one International Harvester plant to another.

Whenever you receive anything secured with Acme Steel Strapping, know that the shipper has taken to get it to you safe. He has beat the threat of damage-in-transit and has cut the cost of packing and shipping, too.

Acme Steel Strapping does all these things. It makes packing and loading easier and faster. It provides better protection during shipment, and

helps insure S.A. (Safe Arrival).

Almost certainly, Acme Steel Strapping or Acme Steel Stitching Wire methods can help somewhere in *your* operation. If you have any kind of a shipping or materials-handling problem, we may have just the idea you need. Write Acme Steel Products Division, Dept. S-43, ACME STEEL COMPANY, 2840 Archer Avenue, Chicago 8, Illinois.



STRAP IT... STITCH IT... SHIP IT... SAFELY!

**ACME
STEEL**

Concluded from page 10

but removing it after forming p
another problem.

Whom could we contact at the
Co. for information on the lu
they use in forming their co
stainless sheets?

H. E.
H. H. Rober
Ambre

- Write to Dr. Joseph Winlock, metallurgist, Budd Co., Philadelphia, ED.

The Blast Furnace Reappears

I have just read Charles E. A's article "Don't Write Off the Blast Furnace" (Mar. 16, p. 110). We like very much to obtain this co article and are enclosing a letter addressed to the author which we you will kindly forward to him. not see any notification that you have available any reprints of the title. But if you happen to have we would be very glad to have you apply them.

J. R.
Kaiser E.
Division of Henry J. KA
Oakland

- We have forwarded your letter to Mr. Charles E. Agnew, 17628 W. 107th Rd., Shaker Heights 20, O. We are setting aside three sets of tear sheets of Mr. Agnew's articles which will in four installments. Upon completion of their publication, we will mail to you.—ED.

Sheet Steel Producers Want

I am interested in obtaining a list of all prime producers of cold and rolled sheet steel including the small hand mills. Will you please advise if such a list is available either in a of a publication or a separate list.

Harold R.
Orley Brothers

- We believe you can get your list by referring to the market prices of any issue of STEEL or from the "Buyers' Guide for Steel Buyers" which appears in the 48-page special section of the Jan. 1951, issue of STEEL.—ED.

Roundup Time for Tear Sheets



We will appreciate your sending tear sheets of the following which we believe may be helpful in our work:

Tube Packaging (Sept. 8, p. 18)
Wrap Up Savings in Scientific Aging (Oct. 6, p. 57)

Ultrasonic Cleaning Pays Off
Small Parts (Nov. 3, p. 92)

Drawing Dimensions in Their (Aug. 25, p. 115)

How an Inventor and Engineer Creates (Nov. 10, p. 79)

Packaging Systems Need (Aug. 25, p. 91)

D. M.
Cherry-Burre



At the Touch of a Button

...FASTER HANDLING, LOWER COST

● Here's how a typical plant turned a slow, costly handling job into a simple push-button operation. Consider the savings you might get in time, money and manpower by following a similar step.

The job was to remove wire from winding drums and convey it to the next operation. To reduce costs, a new idea was tried: a ½-ton, single I-BEAM READING ELECTRIC CRANE was custom-built for the job. All motions were motorized. Now one man controls the entire operation faster and more economically—by simply pushing the right button!

If you, too, are looking for a way to speed up your own materials handling, and save money doing it, here's the step that can pay off for you. Simply get in touch with READING. At no obligation, one of our engineers will gladly analyze your handling requirements and give you a practical recommendation for obtaining the results you want. A note on your letterhead will put him to work.

Reading Crane & Hoist Corporation, 2102 Adams Street, Reading, Pa.

READING CRANES
CHAIN HOISTS OVERHEAD TRAVELING CRANES ELECTRIC HOISTS



Stainless, carbon, alloy and high-speed tool steels and non-ferrous alloys descaled in from 15 seconds to 20 minutes.



Drawing compounds and paint stripped from metal stampings in 50 seconds.

CLEAN... DESCALING... DESANDING

...faster, better at appreciably less cost

removing metallic oxide scale from huge plates, or bars to desanding molds or cleaning residual materials from stampings, the Ajax Electric Salt Bath process paves the way to appreciable savings in floor space and time. What's more, the work is far more efficiently than is possible with sanding, acid pickling, electrolytic anodic cleaning or other methods.

The Ajax Salt Bath Furnace is adaptable to many metal and alloy types. Different metals and different shapes can be descaled simultaneously. The process acts uniformly on all parts of the work including holes. The process reacts only on scale, sand or similar materials. The base metal is not affected and there is no hydrogen embrittlement. First cost of the equipment is low and so is upkeep. Pot and electrode life measured in years and the bath can be regen-

erated indefinitely by the addition of low cost chemicals. Where desired, the entire process can be mechanized for highly efficient mass production.

Write today, giving details of your finishing problem. Let Ajax engineers prove these claims—at not the slightest obligation. Reprinted technical articles on cleaning, descaling and desanding are available on request.

Before



After



Grease, drawing compounds, residual rubber, carbon black, plastics, paint and enamel removed in minutes with less labor.

Residual sand removed from these pump casings by 3-minute salt bath immersion at 700° F.

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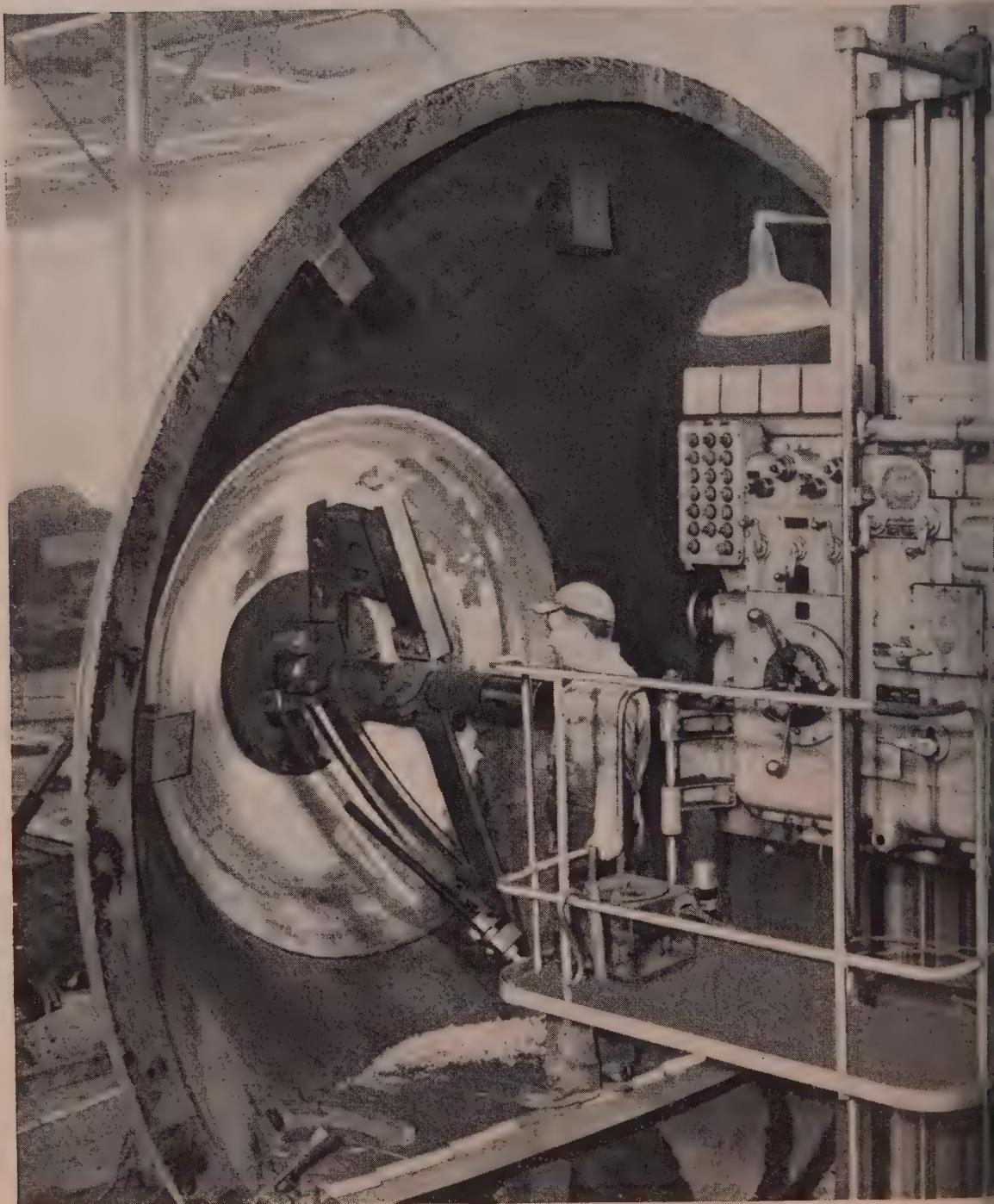
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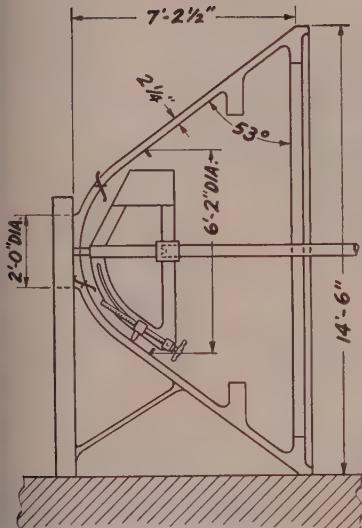
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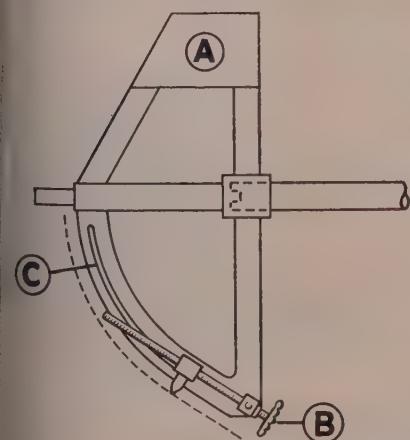
How would you finish in a $14\frac{1}{2}' \times 14\frac{1}{2}' \times 7\frac{1}{2}'$?



spherical radius cast steel workpiece?



Casting is set up on edge, and 8" I-beam tripod welded to support it. Jacks are used at outer rim for bracing . . . stops are set in floor plate to provide additional rigidity. Special fixture on machine spindle revolves inside casting.



Size of special fixture requires counterweight, (A). As machine spindle revolves fixture, star feed cutter (B), and holder in travel in machine slot in fixture (C) . . . controlled path generates the spherical radius. As operation proceeds toward center of bell, it is necessary to change the length of the actuating screw to avoid interference with the casting.

This unusual job on a 38,000-lb. blast furnace bell is simplified by use of a G&L 560-F floor type Horizontal Boring Mill

A versatile G&L machine, relatively inexpensive tooling and ingenuity . . . here's how they provided an answer to an unusual problem.

William B. Pollock Company of Youngstown, Ohio, took full advantage of the G&L floor type's open construction and excellent versatility.

First of all, they designed a somewhat unusual setup. The circular rough finished casting is set on edge facing the machine's main spindle. Eight-inch I-beams welded to the casting's top and extending to the floor act as braces. Jacks and stops are also used to keep the bell rigid.

After a $2\frac{3}{4}$ " pilot hole is drilled and bored through the center of the top of the bell, a hardened bushing is inserted. This bushing serves as a pilot for the extension of the special fixture. The latter (see illus. lower right), is essentially a star feed tool with the tool holder traveling in a machined slot in the fixture. Its movement controls the path of the tool and generates the spherical radius. Stock removal varies from $\frac{1}{4}$ " to $1\frac{1}{2}$ ", depending on the concentricity of the rough casting.

In the photo, you will note the large unfinished portion in the center of the casting. It will be finished after the larger diameter has been finished to depth. This is done to remove surface imperfections such as the one appearing above the operator's head in the photo. To complete the job it's necessary to use a longer actuating screw to push the tool around to that part of the cam track.

If you, like William B. Pollock Co., face unusual production problems, call in your G&L representative. He'll be pleased to help you solve them . . . tell you how you can take advantage of the 5-point G&L analysis service. **BUT DON'T DELAY . . . DELIVERY ON G&L MACHINES MAY BE BETTER THAN YOU THINK.**

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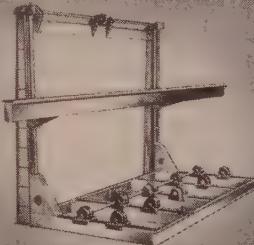
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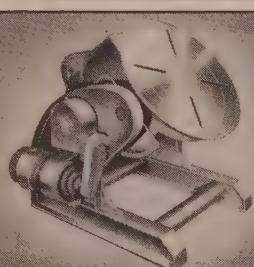
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- TURNING ROLLS
- AUTOMATIC WELDING FIXTURES



UNIT TYPE AUTOMATIC WELDING TURNING ROLLS

- ★ Combines adjustable track support and turning rolls into one fixture
- ★ In 5 standard models
- ★ Capacities up to 9 tons, 12 ft. diameters
- ★ Vertical and horizontal powered track adjustment on larger models



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- ★ Machined face with cast-in "T" slots
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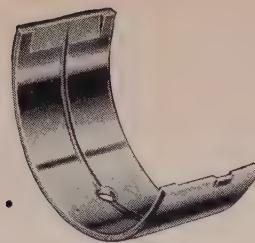
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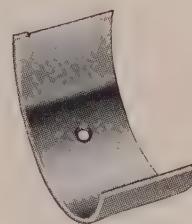


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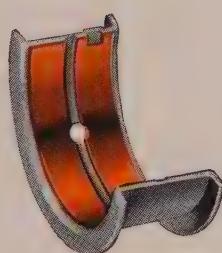
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Problem . . .

GETTING GREATER FLEXIBILITY, MAXIMUM UTILIZATION OF SCARCE STEEL WITH SMALLER INVENTORIES . . .



Industrial building corridor shows the variety of panel widths required. Note ripple-free flatness of panels. Hauserman can cut these from one width of coil stock.



Neat, trim business office of Hauserman panels. Note clean lines and wainscoting. Hauserman now can produce any width from wide coils, eliminating heavy steel inventories.

The E. F. Hauserman Company, Cleveland, Ohio, is the world's largest manufacturer of movable steel partitions and wainscot panels. Their operation demanded flat steel of innumerable dimensions, trimmed and leveled to precision flatness. As the sheets came from the steel mills they were stretcher leveled to commercial tolerances, or a buckle of not over $\frac{1}{4}$ " high. But in the manufacturing of Hauserman partitions, they insisted on the maximum tolerance of $\frac{1}{16}$ ", or practically dead flat.

The steel mills had met Hauserman's flatness

requirements, but it was costly for them as well as Hauserman. Steel producers encouraged Hauserman to look into the possibilities of providing their own leveling facilities. Add to this the fact that Hauserman's operations required sheets of many sizes in lengths from 3 to 12 feet and widths from 1 to 5 feet. In using mill sheets Hauserman had either to stockpile multiple lengths and widths to obtain a flexible inventory or to stock larger sized sheets and trim them as they were needed — which resulted in unnecessary waste.

Solution...

WEAN COMBINED SLITTING, SHEARING AND LEVELING SET-UP FOR MANUFACTURING PLANTS PROVIDES THE ANSWERS



Receiving end of Wean shear line shows compact, easily maintained arrangement. Elevated control stand permits full view of all operations.

Encouraged by basic steel producers Hauserman engineers decided to do their own slitting, shearing and leveling. Working with Wean Equipment Corporation's engineers a complete operation was designed and built that enables Hauserman to buy commercial coil stock in a minimum of widths, shear to desired dimensions, level as required — to maintain complete stocks with a minimum inventory.

The first station on the Wean line is an uncoiler from which the stock passes into a gang slitter where it is edge trimmed and slit to desired widths. The steel may then be recoiled and stored. When sheets are desired, the stock by-passes the recoiler and enters the flying shear to be cut in sheet



Precision leveling and accurate shearing with effortless ease. Note slitting attachment (left foreground) that can be easily engaged for the production of narrow strip.

lengths. Semi-automatic roller conveyors enable Hauserman to move the steel to storage or to send it through the leveling section of the line where the roller leveler actually delivers improved flatness over the stretcher leveled stock formerly used.

THE ANSWER IS RESULTS . . .

Wean maintains perhaps the most experienced staff of special machinery and equipment engineers and construction craftsmen in the nation.

Whatever your special machinery problem, your engineers can have this result-getting combination by contacting Wean Equipment Corp., 22800 Lakeland Boulevard, Cleveland, Ohio.

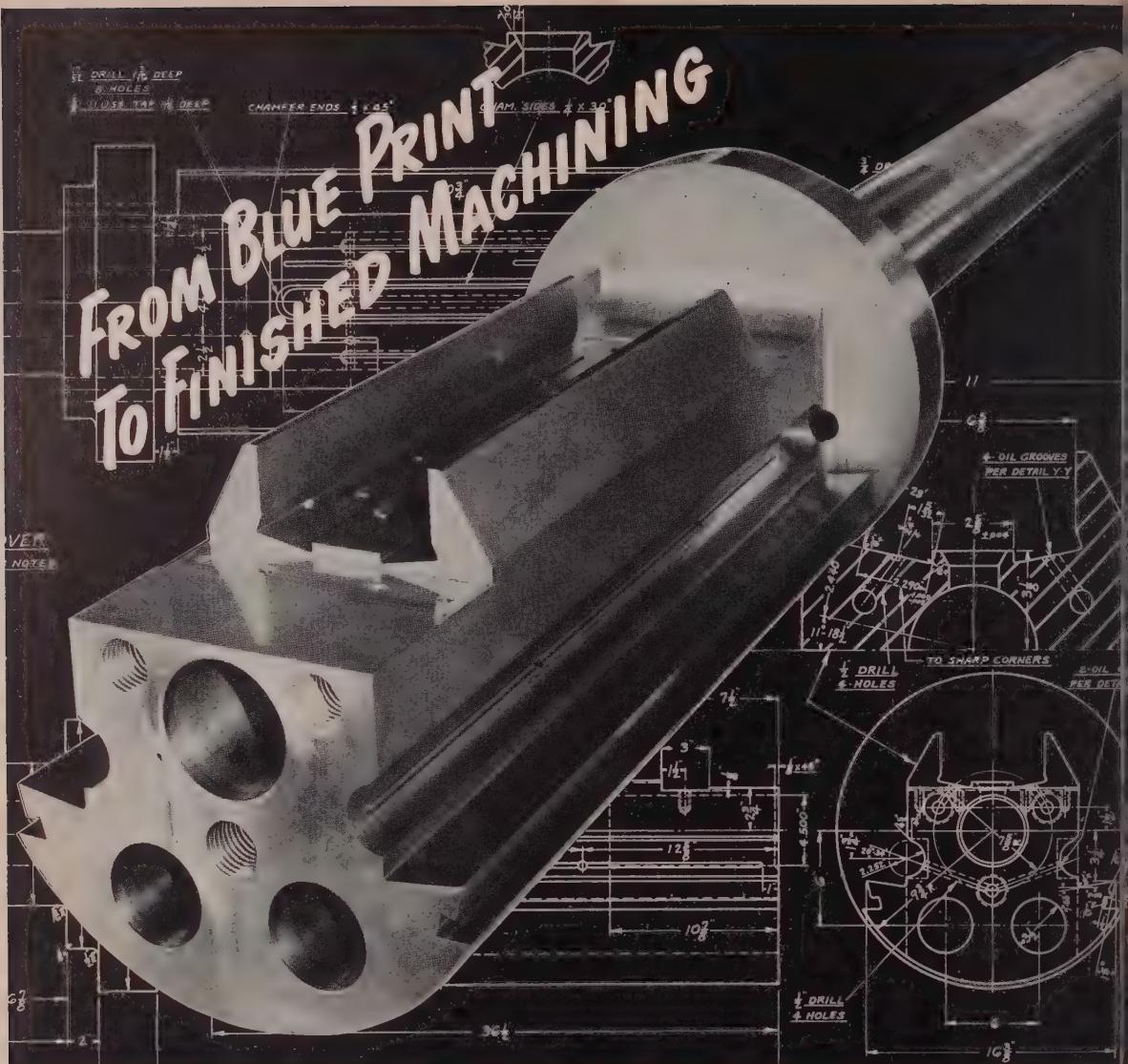
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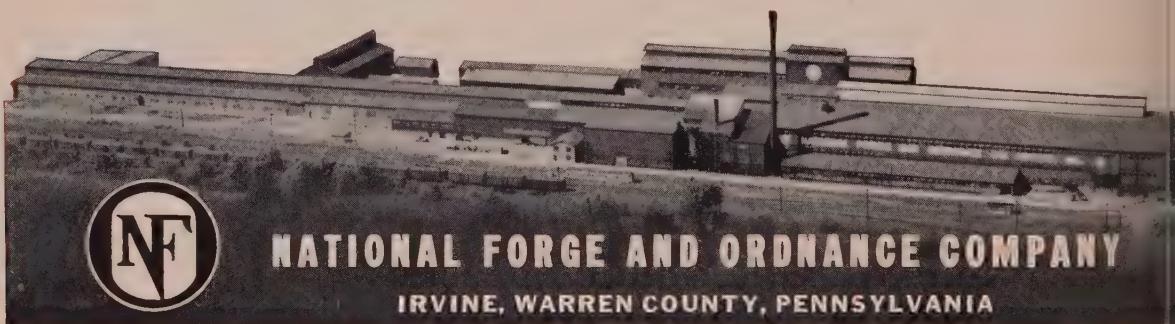
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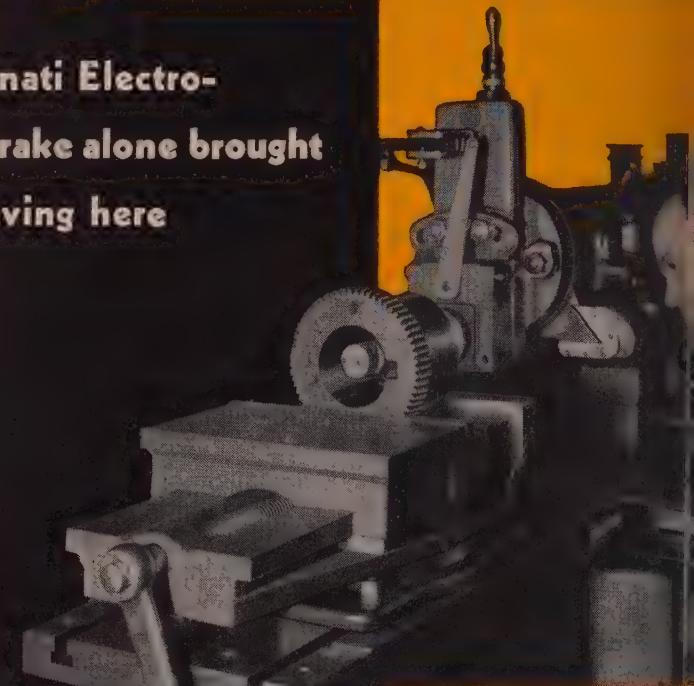


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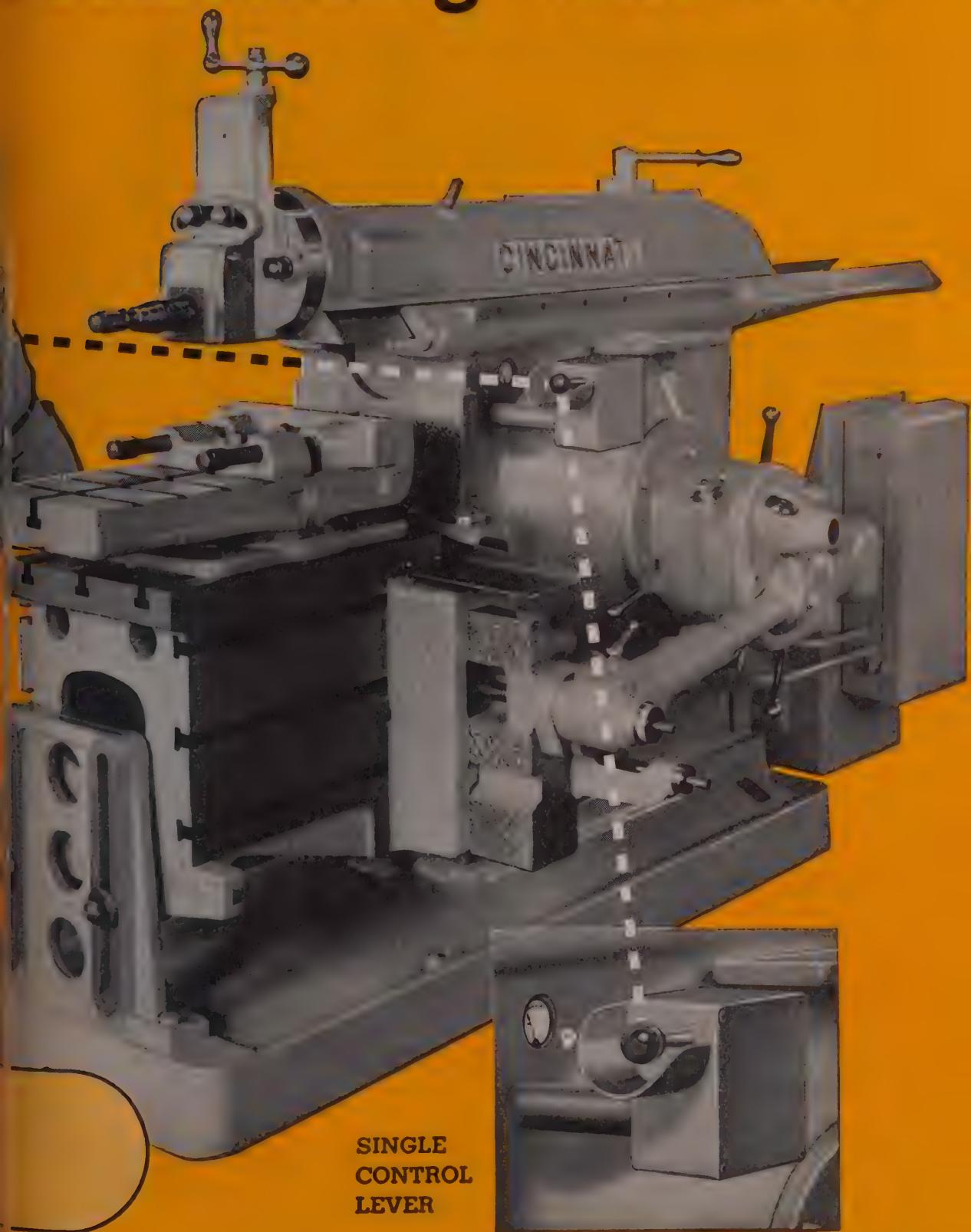


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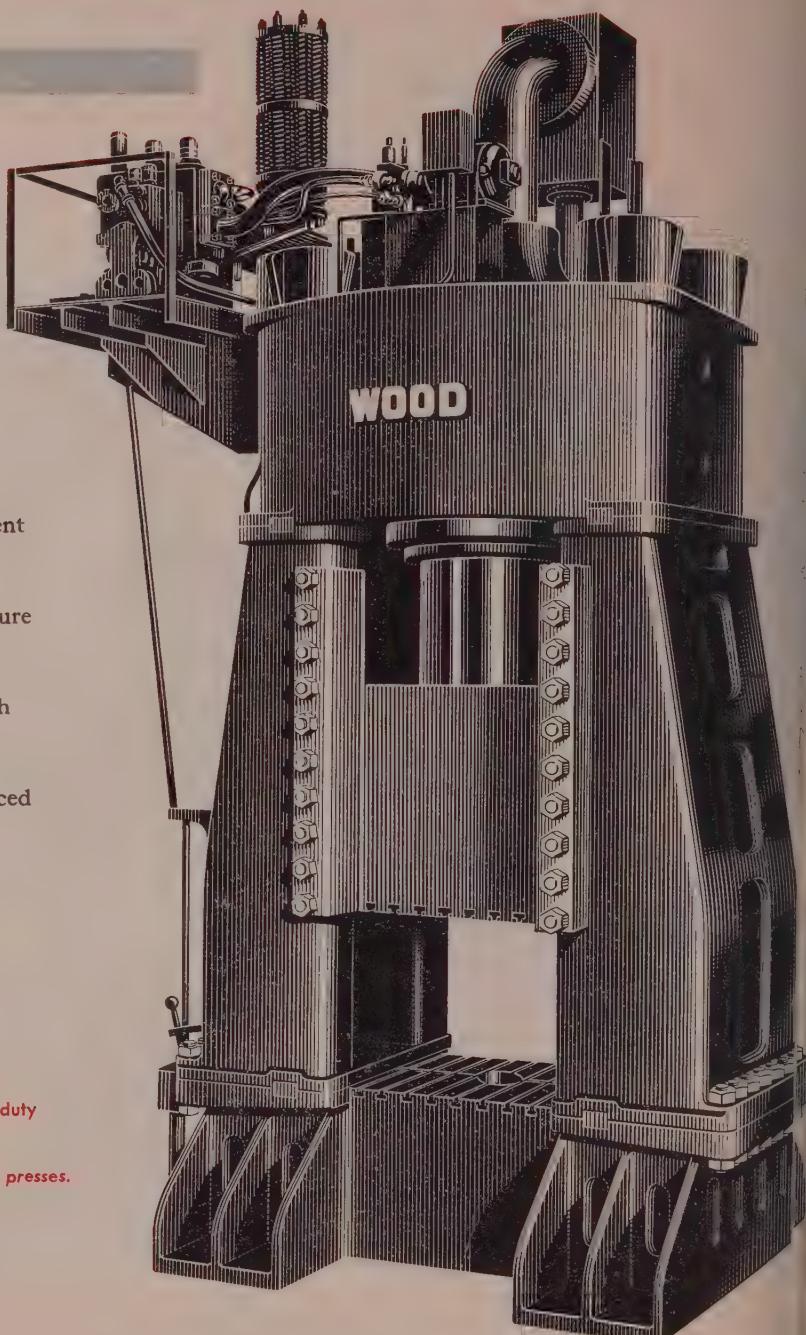


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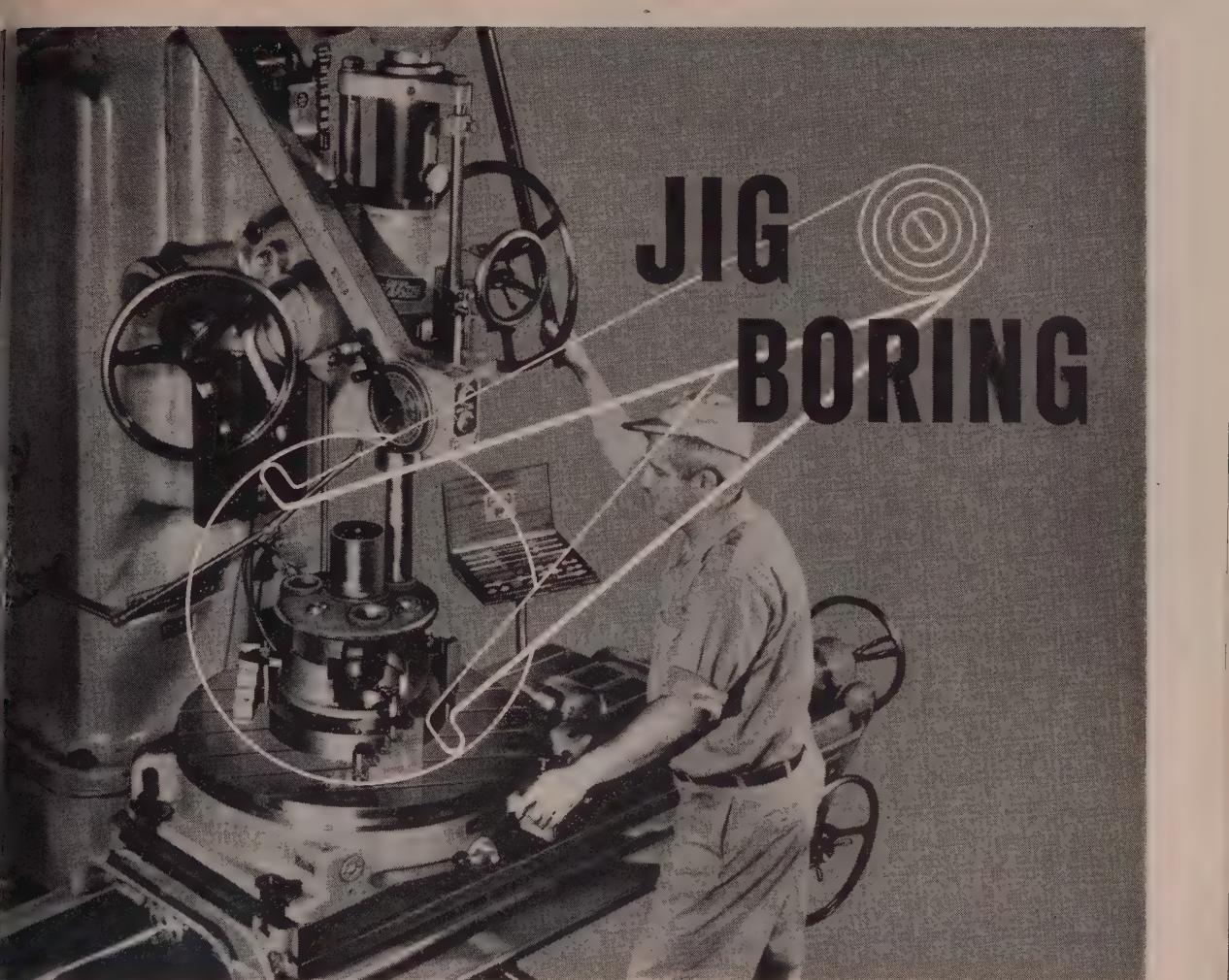


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by Phillips



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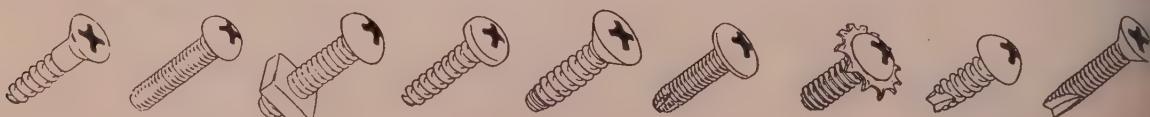
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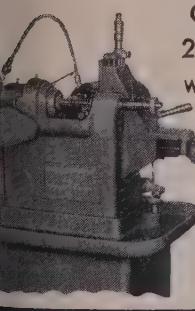
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the generation of spur gears and pinions only.

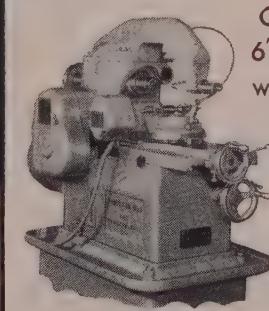
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workpiece.



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Exclusive Alignment and trueness of work and hob spindles are held to within .0002".

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New Dings MA Scrap Separator

OTHER DINGS SEPARATORS



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BOTTOM — Rugged non-electric Perma-Drum separating iron chips from red brass.

More \$\$\$ for Non-Ferrous Scrap with —

NEW DINGS "MA" NON-ELECTRIC DUAL ZONE SCRAP SEPARATORS

DINGS, MILWAUKEE — You'll get more money when you get the iron out with a Dings *Dual Zone MA* — a new scrap separator that handles dry, wet, greasy, or oily flows of loosely entangled scrap with equal ease. Iron is double-trapped in the Dings MA — scrap is passed through *two* magnetic iron removal zones to doubly insure the cleanest product possible.



HOW IT WORKS — Mixed scrap from vibrating feeder flows down chute through two magnetic zones created by powerful, non-electric Dings Alnico Magnets. In each zone iron is picked out and discharged to the side by magnetically induced "fingers" on a rotating disc. Any iron getting through the first zone is removed in the second.

NON-ELECTRIC — You don't need generator sets or rectifiers with Dings MA Scrap Separators. Magnetic permanence of the powerful Dings Alnico Magnet is guaranteed for the life of the separator.

New Bulletin

Get the whole MA story in new bulletin B-1600-A. Write, today!



DINGS MAGNETIC SEPARATOR COMPANY

4710 W. Electric Ave., Milwaukee 46, Wis.

DINGS 



The New Bliss Slitter... First Choice of Another Major Manufacturer

Rugged design and rigid components are only two of the reasons why one of the nation's top automotive electrical equipment manufacturers chose the new Bliss rotary slitter for coils or sheet stock.

Look at all these features:

1. Square gearing enables slitter knives to vary in diameter, permitting cutters to be ground on the periphery; permits knife clearance adjustment to suit gauges.
2. Center bearing controls deflections of arbor where unusually severe loads are encountered.
3. Vertical adjustment of arbor is simplified by handwheel and jackscrew mechanism.
4. Entry and delivery pinch rolls are steel-mounted in anti-friction bearings and spring loaded.
5. Forged steel arbor facilitates alignment of cutter and spacer. Diameters are selected to minimize deflection.
6. Welded steel base is rigidly reinforced to support normal loads. Bliss weldments are thoroughly stress-relieved and shot-blasted.
7. Welded steel housings: Outboard housing is traversed by handwheel and screw mechanism for easy removal of arbors for re-tooling.
8. Gear reduction unit, completely enclosed, has capacity to carry full torque loads.



This 36" Bliss slitter makes cuts from 5/8" to 9-7/16" wide. Material thickness varies from 0.014" to 0.045" lamination steel and sheet insulation. Average speed is 150 fpm.

9. Drive motor, completely enclosed, is available for use with either AC or DC current.

10. Arbor bearings are either anti-friction or plain, depending on the requirements.

Make Your Next Slitter the New Bliss

Bliss offers standard slitters, complete slitting lines and accessories. Bliss slitters are reliable in operation, simple to maintain...a sure

way you can save time and money by slitting your own strip. If job requirements vary from standard, Bliss engineers can design to meet your needs. Write for Bulletin 44.

E. W. Bliss Company, General Office: Canton, Ohio
ROLLING MILL DIVISION: SALEM, OHIO

E. W. Bliss (England) Ltd., Derby, England

E. W. Bliss Company (Paris), St. Ouen sur Seine, France

Branch offices in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo; and Toronto, Canada. West Coast Representatives: Moore Machinery Co., Los Angeles and San Francisco; Star Machinery Co., Seattle. Other dealers in United States cities and throughout the world.

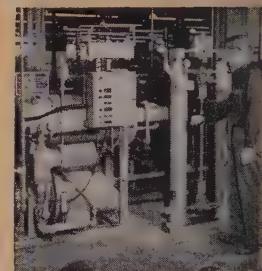
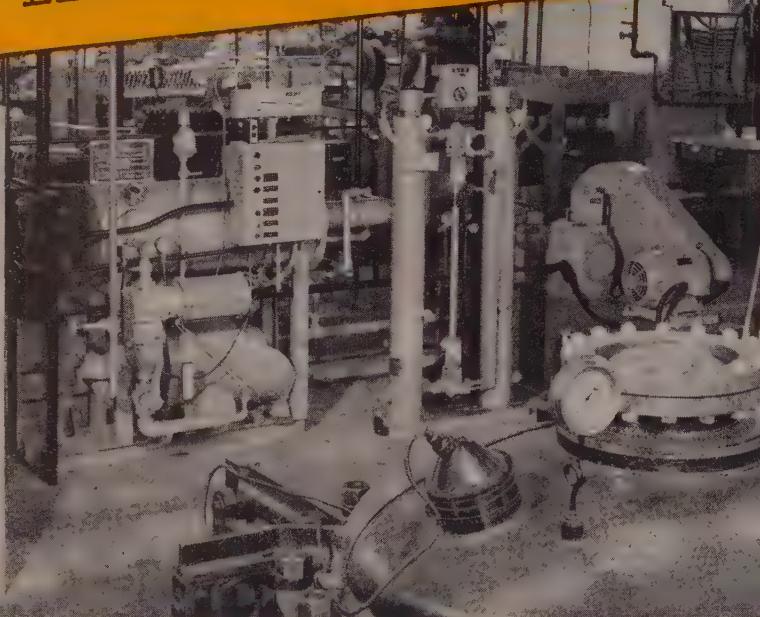
Remember: for Presses, ROLLING MILLS,

Special Machinery...

It's Bliss

Case No. 59

Kemp-Generated Inert Gas is Safer for National Electric Coil Co.



How National eliminates danger of explosion . . . cheaply and conveniently

National Electric Coil Co., Columbus, Ohio, impregnates electric coils and windings by forcing in a hot sealing compound with inert gas under pressure. Formerly, the Company used air under pressure, but this created an explosion hazard. National then switched to CO_2 generated by melting dry ice. Although this decreased the danger factor, it was an extremely expensive operation and very inconvenient. To modernize this process and cut costs, National installed a Kemp Gas Generator, Model MIHE.

Kemp Solved the Problem—and More

Now National's Kemp installation delivers a completely satisfactory inert—eliminating any danger of explosion. And it delivers it at a *much lower cost* than the former

generating method. In addition, Kemp supplies the gas at the rate required, plus a reserve for storage. As for convenience, the company considers their unit entirely automatic—it is practically never touched. According to Mr. D. E. Stafford, Chief Engineer, "It just sits there and operates."

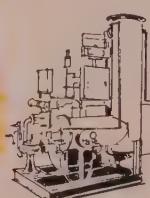
Kemp Can Solve Your Problem Too

Every Kemp Generator is engineered for fast-starting, easy operation that saves both *time* and *money*. Kemp equipment delivers a chemically clean inert at a specific analysis . . . without fluctuations regardless of demand. And every Kemp design includes the latest firechecks and safety devices. For convenience, safety, and cleaner, more dependable gas—specify Kemp.

Mr. Wm. C. Graessle, of the engineering department, checking the operation. Generator features the Kemp Carburetor, part of all Kemp equipment, to deliver complete combustion . . . without waste, without tinkering.

For more complete facts and technical information, write for Bulletin I-10 to: KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Md.

KEMP OF BALTIMORE



INERT GAS GENERATOR

CARBURETORS • BURNERS • FIRE CHECKS
METAL MELTING UNITS • ADSORPTIVE
DRYERS • SINGEING EQUIPMENT



OR THE STEEL STRUCTURE YOU NEED...

Naturally, shipways dominate the waterfront at the great Sun Ship plant. But, Sun Ship builds for land and sea, and a brief distance from the riverfront is a gigantic complete plant of shops and facilities for building steel plate structures, machinery and special equipment for varied types of industry.

At the spot marked "X," for instance, is the Sun Ship plant where the massive turbine casing shown above was assembled. Then it was shipped in sections to a distant site for a hydroelectric power plant. Building this complicated structure—more than 22 feet in diameter at the intake and with a 60-foot outside diameter—offered no great problem to Sun Ship's master engineers and skilled craftsmen.

In this versatile plant, "X" could mark many shops with facilities for building machinery, pressure vessels and almost any other type of special equipment American industry needs. The operation of this large plant on the Delaware has long been a mighty factor in building a greater America.

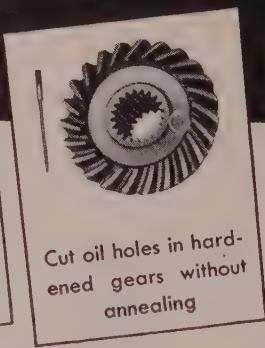
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HIPBUILDING & DRY DOCK COMPANY
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Remove Broken Taps
fast without distortion



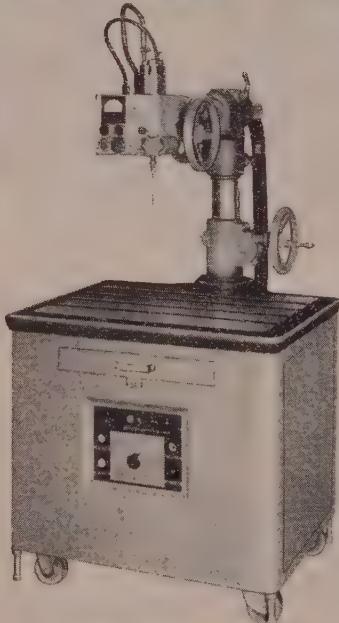
Cut oil holes in hard-
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annealing



Cut dovetails in hard-
ened dies



Cut any shape hole
in cemented carbides



Literally hundreds of thousands of dollars are saved annually by corporations that are using Metalmasters in just tool and die repair alone.

There's a technical engineer in your area to give you an on-the-spot demonstration in your own plant at your convenience. (NOTE: It is not uncommon to pay for a Metalmaster with just one short demonstration thru savings on workpieces.)

For information as to the Metalmasters' uses and benefits merely write today on your company letterhead to:

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DIVISION OF CLINTON MACHINE COMPANY
CLINTON, MICHIGAN

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If you make sieves or staples, screws or screens—whatever you make that takes wire—we're pretty sure to have the kind of manufacturers wire you need. Round, at, square . . . hard, soft, ductile . . . plain, tinned, or right finished . . . carbon, alloy, or stainless. Altogether we produce over 400 different types of wire which are suitable for practically all everyday wire applications.

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UNITED STATES STEEL

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AMERFINE—High-quality fine wire.

AMERSPRING—music steel spring wire.

AMERLOY—alloy heading wire.

AMERTEMP—heavy-duty oil-tempered wire.

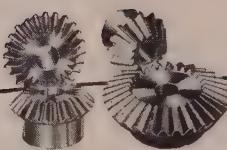
AMERHEAD—uniform heading wire.

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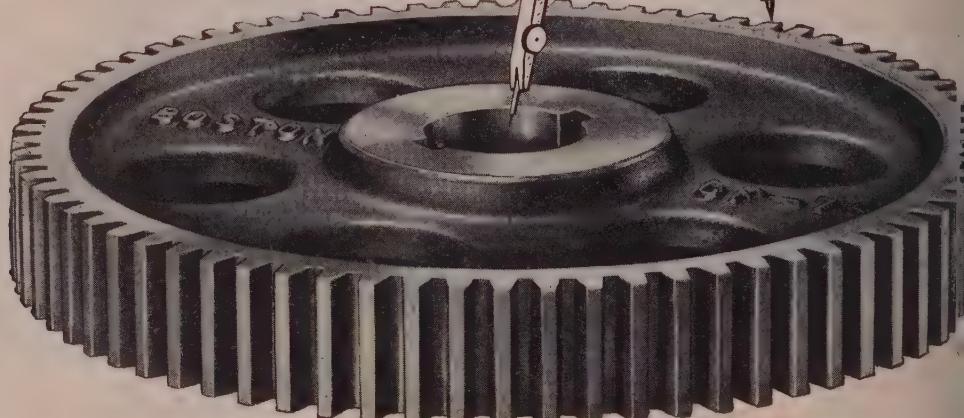
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PILLOW BLOCKS
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UNIVERSAL JOINTS



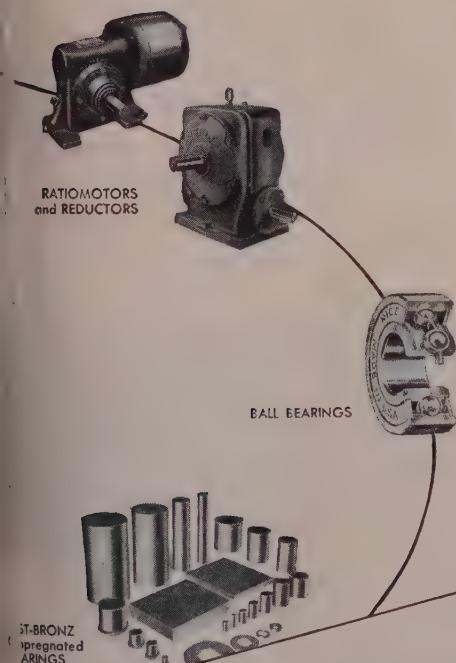
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At Authorized BOSTON GEAR DISTRIBUTORS — a
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The BOSTON Catalog lists over 2000 types and sizes of gears . . . and a full range in the many other BOSTON Power Transmission Products.

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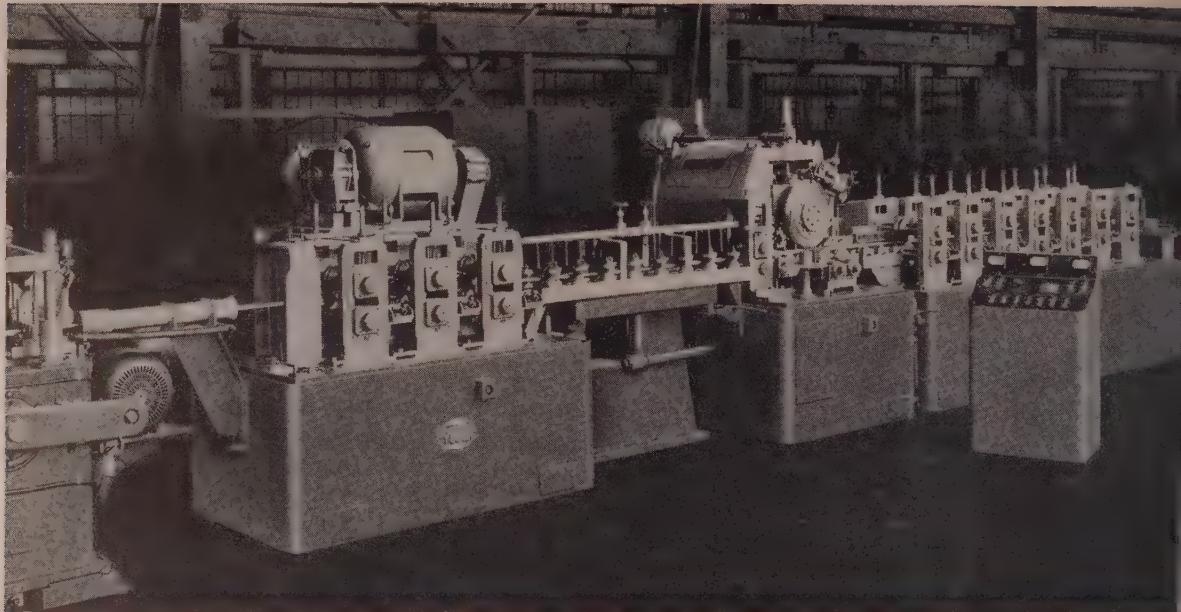
There's no "gamble" when you add BOSTON to your purchasing specifications. BOSTON quality has remained the industry's standard for 75 years. That's why BOSTON products are first choice of more than 250,000 cost-wise industrial buyers.

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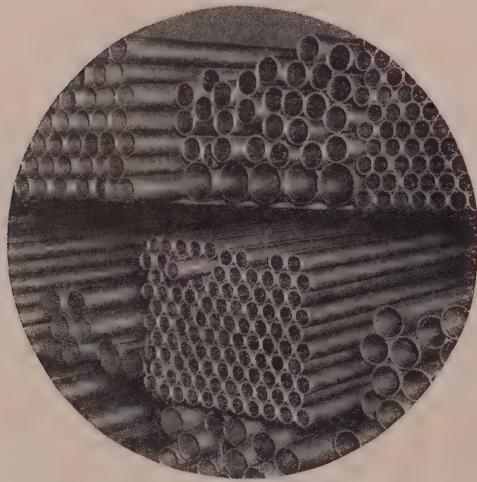
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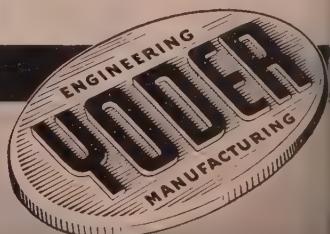
YODER COMPANY • 5502 Walworth Ave. • Cleveland 2, Ohio

• Most manufacturers, when investing in an electric-weld tube mill, do so only after careful investigation, especially of performance records. Where, as often happens, records are available of the output and scrap losses of different mills, making comparisons possible, the choice of a Yoder is never in doubt. As a result, since their introduction in 1938, more Yoder mills have been installed in the U.S.A. and many foreign countries than electric-weld mills of all other makes combined.

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When you need electric motors . . . in any rating, or frame type . . . one or a thousand . . . *always* look for the Fairbanks-Morse Seal. For over 120 years it has stood for the finest in manufacturing integrity to *all* industry.

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Fairbanks-Morse totally-enclosed, fan cooled motor—in a complete horsepower range.



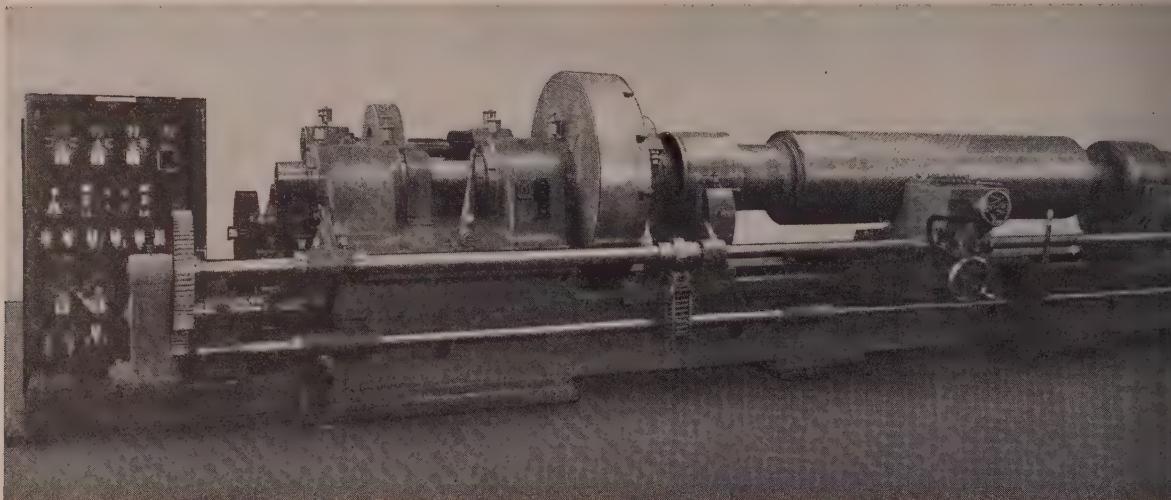
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Engineered Rebuilding

How Simmons Methods Increase Machine Tool Output and Efficiency



REBUILT...REDESIGNED... ITS PRODUCTION TRIPLED

It used to take a manufacturer of steel floor plate 350 hours to groove the alloy rolls which made his plate. "Too slow," they said, and asked Simmons if they could convert a standard lathe to their special purpose. Here's how Simmons' engineers did it:

- **Rotation of the roll, traverse of carriage, and movement of carriage head were all synchronized, and all gears and clutches kept free of lost motion.**
- **Special gearing devised and built which maintains same groove spacing on rolls of varying diameter.**

In addition, the lathe was completely rebuilt—all sliding surfaces replaced... new bearings installed throughout... new motors and wiring.

The result? Average machining time was cut from 350 to 120 hours. Two thirds!

Rebuilding can get results like this for you, too. We'll rebuild and modernize your tools, or buy used ones and rebuild to your needs. Guaranteed performance—delivery within weeks.

Send us a list of your machine tools that might be rebuilt. We'll promptly quote price and delivery. Write, wire or phone today.



Close-up of tool carriage shows how rolls are grooved. The rolls are used in manufacture of steel safety floor plate.

Simmons Machine Tool Corporation
Main Office and Plant:
1755 North Broadway, Albany 1, N.Y.

Export Office:
50 East 42nd St., New York, N.Y.
Philadelphia: Phone Victor 8-3133
Pittsburgh: Phone Penhurst 1-3700

**SIMMONS GIVES USED MACHINE TOOLS
A NEW LEASE ON LIFE**



sharp... accurate threads



REPUBLIC UPSON BOLTS AND NUTS

Easy to assemble... easy to take apart—and maximum thread area in perfect contact to assure uniform, lasting grip.

More than 20,000 types, sizes and shapes of Republic Upson Bolts and Nuts have been designed and engineered to give peak performance *during* and *after* assembly.

Millions of these top-quality fasteners, in countless applications throughout the world, testify to their many advantages.

REPUBLIC STEEL CORPORATION

Bolt and Nut Division
CLEVELAND 13, OHIO • GADSDEN, ALABAMA
Export Department: Chrysler Bldg., New York 17, N. Y.



Entirely New!



Designed especially to meet present day needs . . . for unprecedented man-hours savings . . . *strong enough* to use carbide tools with high precision . . . *fast enough* to supplant obsolete chucking methods up to 5 to 1 . . . *versatile enough* to demonstrate "UNIVERSAL" chucking application.



Remember—

You can't do **TODAY'S** job . . . with **YESTERDAY'S** tools . . . and be in business **TOMORROW**

Announcing the

"MC-UNIVERSAL"

the Entirely New 12-inch ACME-GRIDLEY
SINGLE-SPINDLE
AUTOMATIC CHUCKING MACHINE

1 **WORK CYCLE AUTOMATICALLY CONTROLLED**—no time loss between loading and unloading work piece.

2 **SIX PREDETERMINED SELECTIVE SPINDLE SPEEDS**, with each combination of change gears, insure correct surface speed for each operation. Wide range of spindle speeds — 25 to 1478 RPM.

Two Automatically Selective Feed Ranges with each combination of change gears—for coarse or fine feeds to suit the particular tooling cut.

Five End Working Slides—each independently cammed, and two heavy cross slides—the time-proved Acme-Gridley design. No slides hanging in the air.

Turret Indexing Independent of cross slide operation—located in rugged outer turret support and driven by independent motor.

Open Type Tooling Zone—easy tool adjustments and quick changeover. Minimum cam changes, large chip area, optional chip conveyor.

Accurate—doubly reinforced frame foundation, precision-cut flame hardened steel cams—sustain close tolerances at fastest feeds and highest speeds modern carbide cutting tools can take.

Easy to Operate—compact, free from gadgets—one man runs 2 machines or more, depending on cycle time of job.

THE NATIONAL ACME CO.
170 EAST 131ST ST., CLEVELAND 8, OHIO

(Clip this coupon to your letterhead)

Send me your Bulletin on the NEW Model "MC-UNIVERSAL" Single-Spindle Chucking Automatic as soon as it is off the press.

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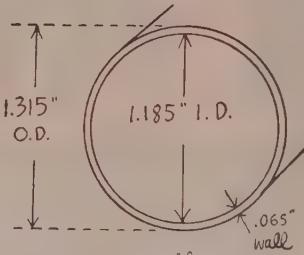
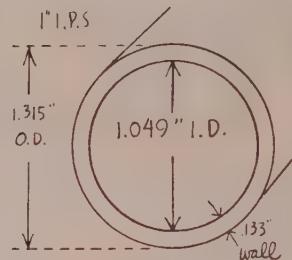
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The NATIONAL ACME COMPANY

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Acme-Gridley Bar and Chucking Automatics, 1-4-6 and 8 Spindle
—Hydraulic Thread Rolling Machines—Automatic Threading Dies
and Taps—Limit, Motor Starter and Control Station Switches—
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here's what you gain with stainless schedule 5 pip



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schedule 40

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You save
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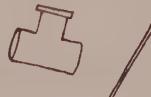
Schedule 5 has the same O.D.
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lines as well as for new
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20% to
27%
greater
capacity

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and capacity in pipe
lines, exchangers and
other equipment.



It's lighter.
This means
quicker and easier
installation.



You can save substantially
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etc., because smaller O.D.
material can frequently be
used. Tubing sizes can now
be replaced with light wall
pipe . . . for ready hook-up
with standard valves, pumps,
and other equipment
normally manufactured in
pipe sizes.



Fittings as well as stocks of
Schedule 5 pipe are carried
by conveniently located
Carpenter distributors.

Specify Schedule 5 pipe . . . it saves dollars . . . and makes a lot of sense!

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, N.J.

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y. "CARSTEELCO"

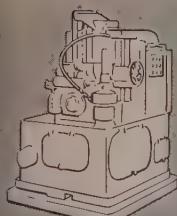
Data Sheets give you complete
information about Carpenter Schedule 5
Stainless Pipe. Write for your
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Carpenter

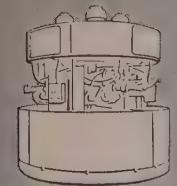
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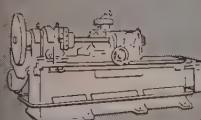
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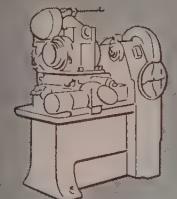
12-S HOBBER



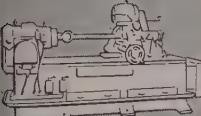
7-A ROTARY HOBBERS



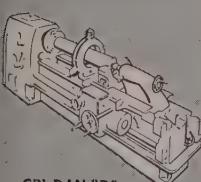
SH SPLINE HOBBER



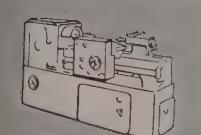
MODEL 40 THREAD MILLER



HT THREAD MILLER

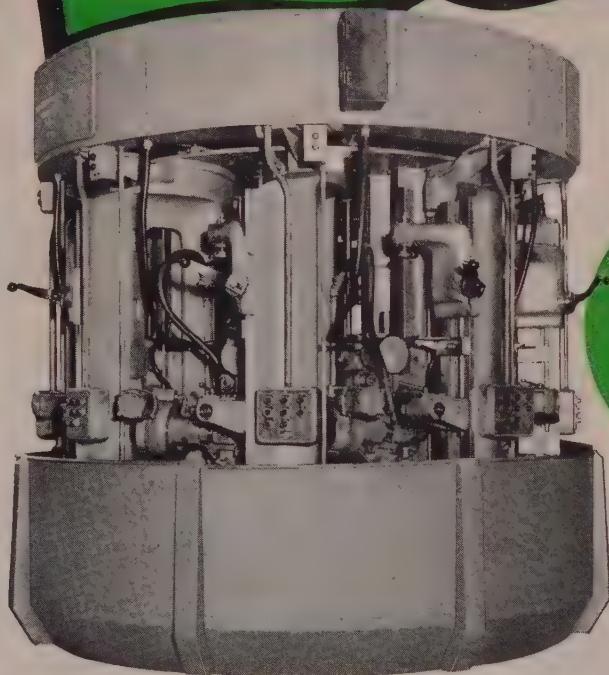


CRI-DAN "D"



CRI-DAN "B"

HIGH PRODUCTION
TOUCH-BUTTON HOBBLING
 With Modern Lees-Bradner 7-A Rotary Hobbers



THE
 LEES-BRADNER
 MODEL 7-A
 8-SPINDLE
 ROTARY HOBBER

Look to Lees-Bradner, pioneers in high-production machine tools, for the ultimate in precision hobbing.

The now famous line of Model 7-A hobbers have established remarkable records in leading production plants throughout the country.

No matter what your hobbing job, or the volume of production required, there's a machine to fill your needs in the 7-A line of eight, six and four spindle rotary hobbers or the single-spindle machine.

For detailed engineering and production data call in your Lees-Bradner representative or write the company direct.

QUICK FACTS ON THE MODEL 7-A HOBBERS

- Push-Button Production Controls • Electric Hob Shifter
- Electronic Counter for Longer Hob Life • Patented Automatic Hob In-Out Mechanism

the **LEES-BRADNER** *Company*
 CLEVELAND 11, OHIO, U.S.A.

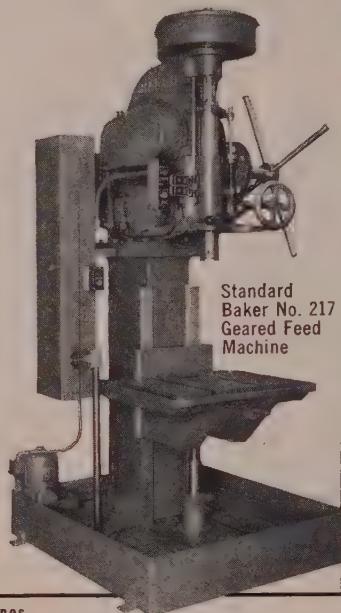
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No. 150 Geared
Feed Machine



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Baker No. 321
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Machine

MAJOR SPECIFICATIONS—Single Purpose Types

	150	150 Q.C.†	217	321	422
1. Capacity—Max. Dia. Drill in S.A.E. 1035 Steel	1½"	1½"	2	3	4½"
2. Max. H. P. Motor used.....	7½	7½"	10	15	20
3. Distance center of Spindle to Frame [Gap]*.....	11"	11"	12¼"	12¼"	12¼"
4. Maximum Spindle Travel.....	11"	11"	12"	16"	16"
5. Spindle—Outside Dia. splined driving end.....	1¾"	1¾"	2"	2-13/16"	3¼"
6. Dia. of Spindle Sleeve.....	2¾"	2.750"	3¼"	4¼"	5¼"
7. Dia. of Spindle Nose.....	2.975	2.975"	.3225	4.225"	5.225
8. Morse Taper in Spindle as standard.....	No. 4	No. 4	No. 5	No. 5	No. 6
9. Standard Speed Range in R.P.M.....	151-632	48-1120	76-614	27-220	20-165

* Can be increased 3" by use of offset Spacer Block. † Quick Change, 12 Speeds

Baker single purpose type drills are heavy duty . . . provide a wide range of speeds and feeds for Single and Multiple Spindle Drilling . . . Reaming . . . Boring . . . Facing . . . Chamfering . . . Undercutting and Tapping Operations. Write for full details.

Baker Brothers, Inc.
Toledo, Ohio

Gentlemen:

Please send more information on Baker Standard Drills to:

NAME.....

COMPANY.....

STREET.....

CITY..... STATE.....

BAKER BROTHERS, INC. Toledo, Ohio
DRILLING...TAPPING...KEYSEATING and CONTOUR GRINDING MACHINES

Industry's Favorite

DIE STEELS

for

COLD WORK



SELECTED FOR

Machinability

Hardenability

Dimensional Stability

Wearability

COLONIAL NO. 6

NON-SHRINKABLE

Oil hardening. Combines machining ease with low hardening temperature and excellent stability. Very widely used.

OHIO DIE

Air hardening. High carbon, high chromium alloy with exceptional resistance to wear, providing long die life.

AIR HARD

Air or oil hardening. A fine steel for intricate dies where movement cannot be tolerated.

These leading First Quality Die Steels cover the field of your most exacting cold work requirements. Specify them by brand, and get the distinctive performance built into each by complete control of manufacture—from our exclusive melting formulas to the last laboratory and production checks of the finished steels. • Do you have our 24-page Cold Work Die Steel Catalog?



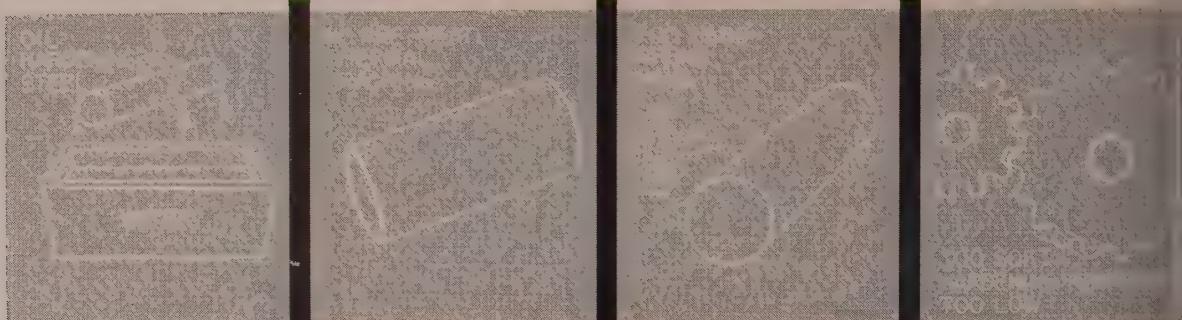
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One of the most common causes of error in heat treatment is failure to give the heat treater necessary data on the physical properties and chemical composition of the material to be treated.

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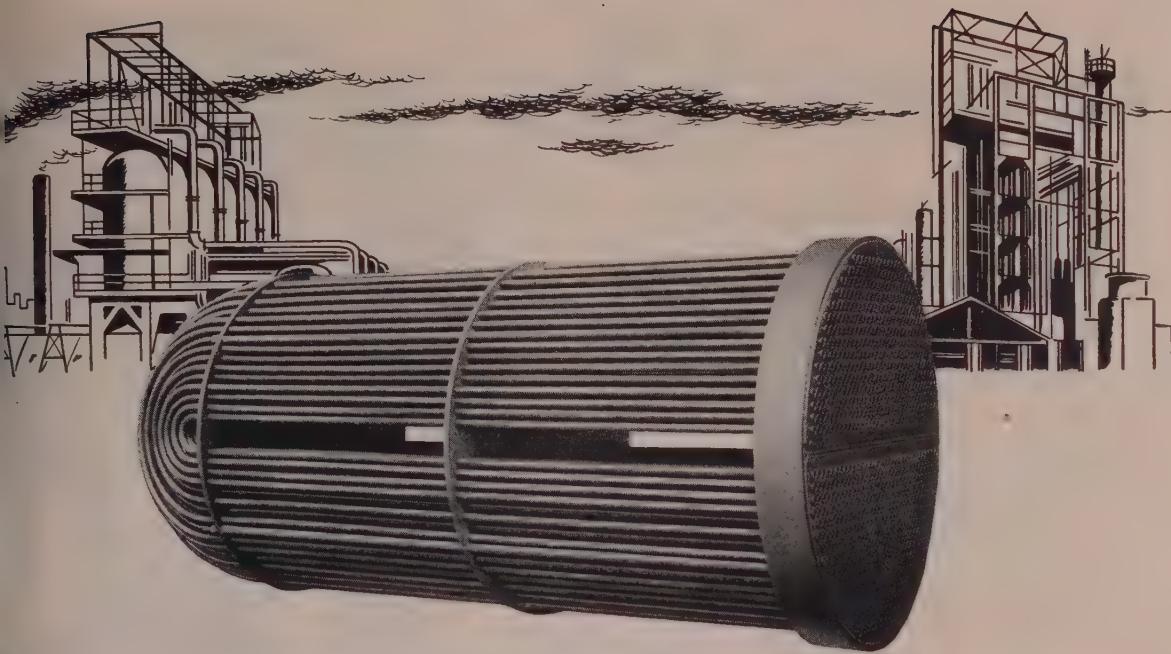
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Pacific has the mill . . . the engineering and metallurgical know-how . . . the modern equipment to produce cold-drawn seamless tubing; welded and drawn stainless steel tubing; welded carbon tubing in both the quality and quantity you need. Our position in the heart of the Western Industrial Area is an additional assurance—that we deliver on-time, every time.

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Single press stroke saves
\$10.00 worth of machining

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Because even tough aluminum aircraft alloys are ductile and formable, Alcoa engineers and aircraft designers saw the savings possible by impact extruding this part. Today, a slug of tough aluminum alloy is placed in a shallow die—a punch strikes it—the aluminum squirts upward, faster than the eye can follow. Almost instantaneously a plunger is ready for finish machining and assembly—a saving of \$10.00 per part.

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Though impact extruding is not new, it has been confined to simple, cup-shaped parts of workable alloys. But here, a tough alloy has been extruded. Nor is the shape simple. It is *thick bottomed, heavy walled* and the open end is flared, all an integral part of the extruding process. Impact extrusions, as Alcoa makes them, compete with almost every fabricating process. Let your local Alcoa Sales Engineer help you explore their possibilities. Aluminum Company of America, 877-D Alcoa Bldg., Pittsburgh 19, Pa.

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This strong, one-piece oil filter housing is an aluminum impact extrusion, produced by Alcoa in a single press operation. Formerly, this part required several operations.



Fabricating this double-wall fuse cap formerly involved an expensive welding operation. Now it is impact extruded by a single press stroke at Alcoa's Edgewater plant.



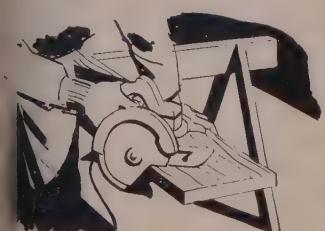
Used in electronic work, this impact-extruded can demonstrates an extreme length-to-diameter ratio which goes far beyond limits formerly believed possible.



Alcoa Aluminum takes all finishes other metals will take—plus framing, rust-resistant anodic coatings which are best on aluminum.



ightweight, easy-to-handle Alcoa Industrial Building Sheet (only 56 pounds per square) goes up fast . . . reduces dead load . . . stays good looking without painting or finishing.



Alcoa Aluminum Die Castings can weigh one-third as much as heavy metal castings, yet provide great strength. They are exceptionally easy to machine . . . take all finishes . . . often cost less.



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Corrosion-resistant bearings of Alcoa Aluminum lower diesel maintenance. They are solid metal all through.



* Almost any shape can be produced as an Alcoa Aluminum Extrusion—hollow, semihollow, solid. Extrusions put the metal where it's most needed, yet use less metal than rolling or fabricating by welding or riveting.

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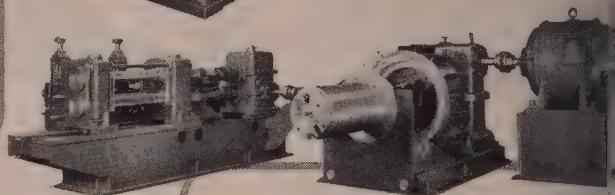
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**Handles ALL Gauges from .010" to .125"
With Exceptional Accuracy and Speed**

Two or three narrow-range slitters can be replaced by this one SECO Precision Slitting Line. This extremely versatile line slits all gauges from .010" to .125"—cold-rolled steel, brass or aluminum. It is highly accurate—and handles all thicknesses on a fast, profitable production basis.

This particular SECO Line is designed for 24" wide strip in coils weighing up to 6,000 pounds. It makes 24 cuts in gauges up to .035" at line speeds from 400 to 1200 FPM—and handles strip up to .125" at speeds from 150 to 400 FPM, making up to 14 cuts.

SECO Slitting Lines, modern in design and rugged in construction, can be built with many efficient features. For more information on SECO Slitting Lines, or the answer to your specific slitting problem, write today. Our engineers will be glad to furnish full information and data—with no obligation to you.



**Combination Pull-Thru and
Power-Driven Line Gives Unusually
Wide Range**

Both the slitter and recoiler on this SECO Precision line are driven from one 40 HP AC/DC adjustable speed motor. The slitter can be used as either a "pull-thru" type for finer gauges up to .035" or "power-driven" for heavier gauges up to .125". The slitter has eccentric rotary or type arbor mountings—to accommodate any knife diameter—with Timken tapered roller bearings. The design can easily be adapted for your particular requirements.

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By AMERICAN BRIDGE

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Administration Bldg. and 578-ft. Loading Dock**

THE new thirty-three million dollar Greater Pittsburgh Airport, opened in June 1952, is an impressive sight. Its sixteen-hundred acre airfield is the second largest in the world . . . larger even than Washington's National Airport and New York's LaGuardia Field combined!

But, as impressive as is the airfield itself, it is overshadowed by the spectacular Administration Building. This seven-story, semi-circular structure with its long loading dock is easily the world's largest terminal building.

American Bridge fabricated and erected the 4,000-ton steel framework for this huge structure which is 460' feet in breadth at its widest point, and with its 578-ft. loading dock has an over-all length of 979 feet. Nine months after the erection crew took over, the last rivet was driven.

This huge building is another example of American Bridge engineering and fabricating "know-how". And it is your assurance that you can depend on American Bridge to handle any type of steel-frame construction with thoroughness and speed . . . any time . . . anywhere. If you would like to know more about the advantages of American Bridge fabricated and erected construction, call our nearest office.

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Coal dust showers over equipment, floors and lines were regular occurrences in one large power plant. Thermal expansion moving steel tubes feeding powdered coal to the burners of high pressure steam boilers.

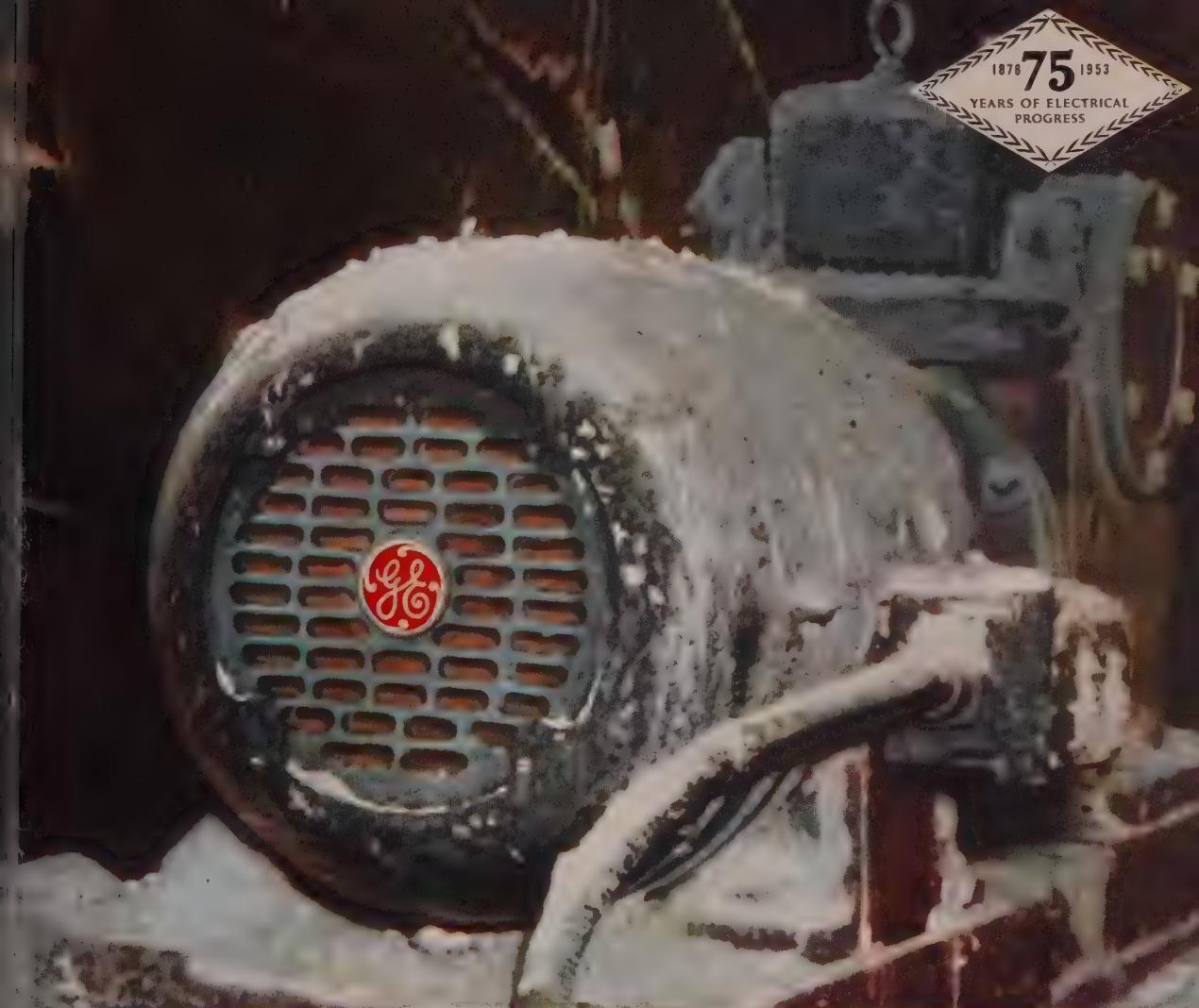
Then Penflex "Flexineering" recommended a flexible steel "overcoat" for the rigid steel feed pipe. Lengths of 20" and 24" I.D. interlocking, galvanized steel tubing were installed. Penflex tubing now forms a flexible seal between the hopper and tube, assuring protected delivery of powdered fuel.

Let Penflex "Flexineering" help you on tubing problems. Penflex manufactures a complete line of four-wall, interlocking and seamless welded corrugated flexible tubing . . . metallic hose, tubing and couplings from $1/8$ " I.D. and up . . . automatic barrel fillers, pneumatic rivet passers, accessories and fittings.

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Corrosion won't hurt this **TRI-CLAD** motor's cast-iron frame

HERE'S A COMMON SIGHT AROUND MANY PLANTS—
A G-E Tri-Clad motor operating reliably and continuously under the extremely corrosive conditions that cause many other motors to fail.

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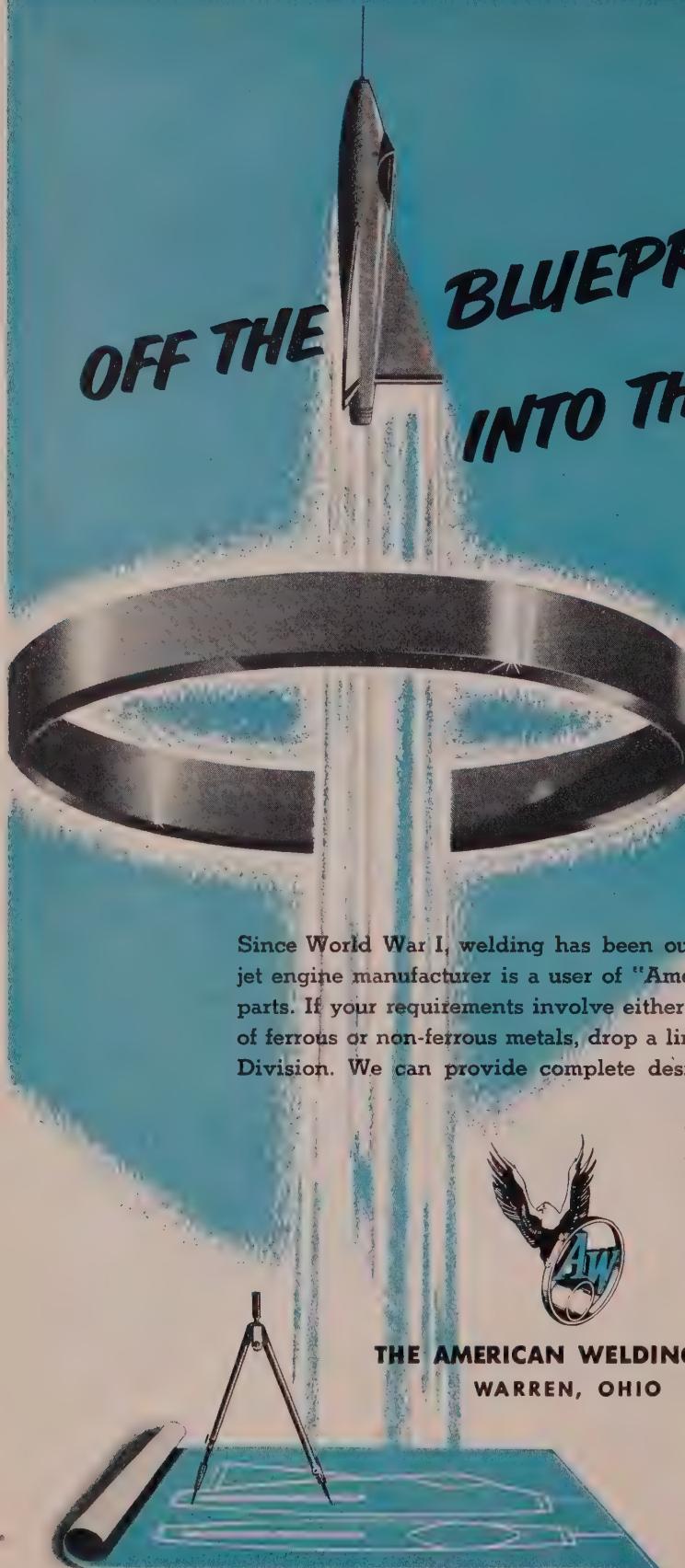
RIGID, CAST STATOR FRAME with integrally cast feet, can't be twisted out of line by accidental jarring or by excessive "bolt-down" pressure on the feet.

STRONG, CAST-IRON END SHIELDS have cast ribs for extra strength without adding extra weight . . . protect the true motor alignment even under heavy shaft loads.

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THE AMERICAN WELDING & MANUFACTURING COMPANY
WARREN, OHIO • 110 DIETZ ROAD

April 13, 1953

No Steel Strike in 1953

Odds are against a strike in basic steel this year. Average wages at \$2.21 an hour are about 25 cents higher than a year ago, but workers haven't yet recovered their financial breath from the two-month walkout in 1952. The companies, themselves, were also winded by the disturbances, so they'll be anxious to avoid a repetition this year when talks reopen in May. As usual, no specific union demand will develop until negotiations are well along.

On the Way Out—Escalator Contracts

Escalator-type labor contracts based on the cost-of-living index are on the way out. When many of those agreements expire, you can expect them to be dropped quietly. Workers no longer like them, particularly since the last dip in the "old series" index meant a 3-cent cut to 1.3 million railroad men and 1 cent an hour less to more than 1 million auto and farm equipment employees. The new battle cry will be the guaranteed annual wage, which will be tested for sound only this year in preparation for a real contest in 1954 or 1955.

A Nudge Toward Unity

A major factor nudging the CIO and AFL toward unity is concern by both over the relative decline in membership among unions. Union members totaled 14.8 million in 1945, 27.5 per cent of the labor force. They total about 15 million now, only 24.6 per cent of the labor force. Significantly, the first step toward unity was taken last week when the two organizations appointed a committee to study ways to eliminate raiding. They didn't say so, but the real purpose of the group will be to figure a more positive approach to boosting membership. Now is the time because employment is at a peak of 61.5 million, and the labor force is approaching 63 million, compared with 62.6 million a year ago.

Appliances Boom

Appliance sales are booming, as well as automotive. General Electric Co., for example, sold 10 per cent more of its major appliances in the first quarter than in the comparable 1952 period. Refrigerators gained 3 per cent, automatic clothes dryers and washers climbed 40 to 50 per cent. But food waste disposers, water heaters and dishwashers dropped 3 to 10 per cent.

Obsolete Capacity Abandoned

U.S. Steel Corp. is abandoning the No. 3 open-hearth shop at its Homestead works. The obsolete, 56-year-old facility had 24 small furnaces capable of turning out about 1 million tons of ingots a year which went mostly into plates and structurals.

Changes at the Pentagon

A big change in Pentagon procurement policies and techniques is inevitable. The copious testimony before congressional committees

pointing to waste and the strong desire by the White House to cut spending make it certain that a reshuffle is near. President Eisenhower alone will decide on the size of our mobilization base, so until he makes up his mind there's no telling when, where or how much the defense program will be cut back or stretched out.

Permanent Small Business Agency?

Pressure mounts for a permanent and independent small business agency. It may not come in this Congress, but the temporary Small Defense Plants Administration is certain to be extended for another year. But highly uncertain of acceptance is an SDPA request that it be granted authority to earmark up to 35 per cent of defense procurement for small business. Smaller companies recently have been getting only about 17 per cent of military expenditures.

The Atom Goes Industrial

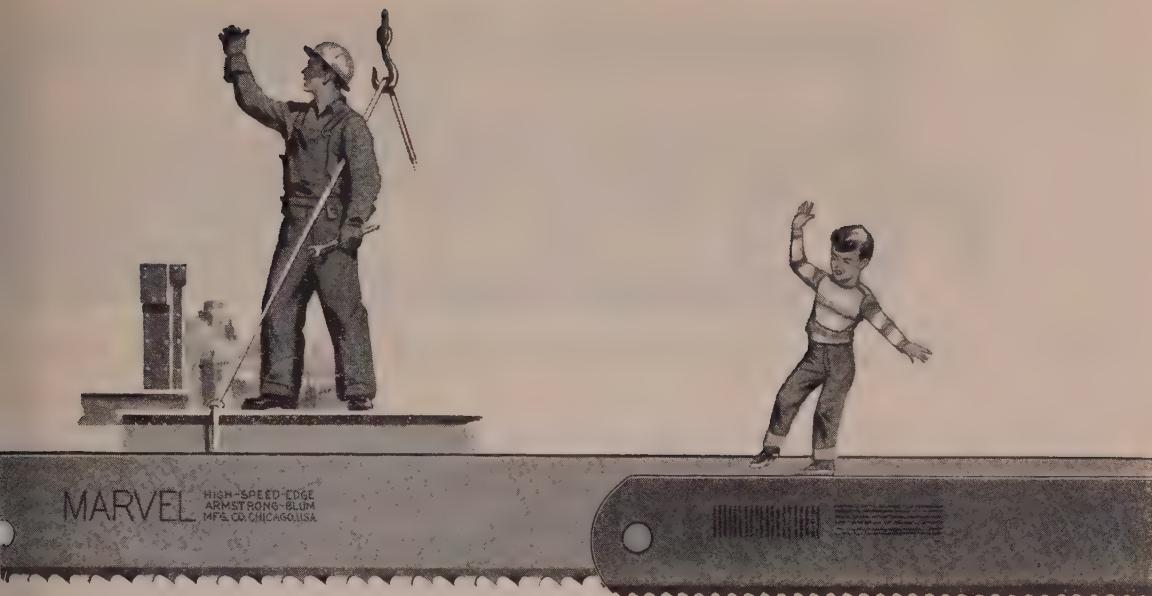
A major accomplishment of the Eisenhower administration could be the encouragement of the use of private capital in atomic energy developments. The greatest industrial interest now is in atomic power, and a new AEC policy to let more firms explore that peaceable use for nuclear energy will soon be explained to Congress. Detroit Edison Co. and Dow Chemical Co. are already well along in their research.

Straws in the Wind

The Republicans have filled only about 200 of the key 900 jobs in the administration thus far . . . Farm equipment sales are rising more than seasonally . . . Armco Steel Corp. will light its new 1300-ton-a-day blast furnace at Middletown, O., Apr. 14 . . . M. A. Hanna Co. hopes to start shipping ore from its Labrador-Quebec project by late 1954 . . . Fenimore Iron Mines Ltd. plans to mine iron ore in the Labrador tidewater and sell it in the U.S. . . . Personal income in February was at an annual rate of \$280.5 billion, unchanged from January.

What Industry Is Doing

Steel, copper and aluminum are nearing a supply-demand balance, although some items are still tight (p. 63) . . . Harvey Machine Co. Inc., Torrance, Calif., is launching a program for integrated aluminum operations (p. 64) . . . President Eisenhower's requests to Congress are winning favorable but cautious consideration (p. 65) . . . Makers of steel fasteners hope to clamp down good sales this year, but the market may loosen in 1954 (p. 66) . . . The transmission chain industry in 1953 is striving to equal last year's exceptionally good sales (p. 67) . . . Machine tool builders, meeting in New York, were unusually optimistic (p. 68) . . . Proposed: A central production board to eliminate waste and duplication of government-owned machine tools now valued at \$6 billion (p. 69).



..but

Experience Cannot be Copied

More than a quarter-century ago MARVEL invented and basically patented the MARVEL High-Speed-Edge Hack Saw Blade—the UNBREAKABLE blade that increased hack sawing efficiency many-fold.

Every MARVEL Hack Saw Blade ever sold has been of that basic welded high-speed-edge construction, with constant improvements from year to year, as EXPERIENCE augmented the "know-how" . . .

MARVEL is not "tied" to any single source of steel supply, and has always used the best high speed steels that became available from time to time as metallurgy progressed. When-as-and-if finer steels are developed—and are proven commercially practical for welded-edge hack saw blades—MARVEL will use them, regardless of cost or source . . .

There is only one genuine MARVEL High-Speed-Edge! All other "composite" or "welded-edge" hack saw blades are merely flattering attempts to imitate — without the "know-how" of MARVEL EXPERIENCE . . .

Insist upon *genuine* MARVEL High-Speed-Edge when buying hack saw blades—and be SAFE, for you can depend upon MARVEL. They have been "tested", "pre-tested", and "re-tested" by thousands of users for more than a quarter-century!



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or how Reliance picked-to-order Sheet and Strip fit your j

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April 13, 1953



A Better Cure

"Britain's Economic Problem and Its Meaning for America" is the title of a thought-provoking report issued by the Committee for Economic Development. It merits the careful attention of American industrialists, not only because it deals realistically with our relations with our strongest and closest ally, but also because it may suggest a new approach to our problems of economic assistance to other nations.

After tracing Britain's economic problems from the end of World War I down to the present time, the report goes to great lengths to dispel the recent fallacious assumption that Britain's difficulties are a temporary result of the two great wars. Belatedly, Britons and Americans are beginning to realize that Britain's troubles are too deep-rooted to be cured by short-term shots-in-the-arm assistance.

Unfortunately this brutal discovery is raising misgivings on both sides of the Atlantic. "If these tendencies in British and American opinion were allowed to grow," states the report, "they could undermine the present partnership. Under the pressure of economic difficulties British morale could waver and Britain could drift toward neutralism. If these things should happen, the seriousness of the ultimate results both for Britain's and for America's security, and for that of the rest of the world, would be difficult to exaggerate."

It happens that "neutralism" of Britain is one of the Kremlin's main objectives today. Perhaps its present conciliatory policies are aimed at that target. For that and other reasons we should try to better understand Britain's problem and to deal with it more intelligently.

C.E.D. offers numerous recommendations. It points out that British industrial management has been "less vigorous, imaginative and aggressive" than its American and German competitors. British labor has resisted change and progress. These attitudes should be corrected. Britain could be helped by greater investment of American capital in Britain, but here the British should make the opportunities for such investment as favorable as they are in Canada. Above all, opportunities for Britain to export certain products to the United States should be expanded.

In short, private competition, investment and trading may succeed where government assistance has failed.

EDITOR-IN-CHIEF

THESE THINGS WE NEED: Foreign trade is destined to be a hot subject of debate for months to come. As a matter of principle, almost every consideration of federal policy calls

for as much freedom in trade as possible. Unfortunately this concept collides head-on with the belief of many employers and employees in certain industries that their products, manufac-

tured with the assistance of highly paid workers, should be protected by tariffs against the competition of poorly paid foreign workers.

Resolving the inevitable conflicts in this field of foreign trade will be exceedingly difficult, but it may be eased somewhat by multiple deals whereby we can import urgently needed strategic materials from countries in Asia or Africa and the dollars thus received can be used to purchase manufactures from European industrial nations which are thirsty for dollars.

We in the United States (p. 73) are dependent 100 per cent upon foreign sources for industrial diamonds, tin and columbium. Ninety per cent or more of our requirements for chromite, nickel, mica, manganese and cobalt come from abroad. Our needs for these and other strategic materials should be integrated into our complex foreign trade problem.

* * *

WASHINGTON GREMLINS: As the first quarter of President Eisenhower's administration draws to a close, there is mounting evidence of the inclination of many officeholders in Washington to resist change. One sees it not only in the attitudes of numerous federal employees but in the pointed questions which many journalists and commentators put to Eisenhower appointees when they appear on radio or television programs.

Many of these individuals have become so thoroughly obsessed with the idea that the federal government is papa and mama to everybody, that they cannot understand why anybody should try to economize, reduce the budget, or require a federal employee to put in a full day's work. Among hundreds of thousands of government wage earners there is an instinctive zeal to oppose every effort of the new administration to cut Washington bureaucracy to size.

As in England, the path from socialism back to sound ground in the United States is a difficult one.

* * *

BALANCE NOT FAR OFF: Estimates of when supplies of important primary metals will overtake demand have been revised many times during the past few years. Today the best information seems to indicate that a balance between supply and demand for copper is on the point of being achieved (p. 63), it will occur in aluminum around midyear, and will take

place in the steel industry in the four quarter.

Experts believe that the potential output of steel ingots in 1953 will be approximately 118 million tons and they estimate that actual demand will be about 114 million tons. They figure that the potential supply of copper will be 1.6 million tons, of which demand will account for 1.4 million tons. Aluminum output is expected to be 1.5 million tons, all of which will be consumed.

Should these estimates of consumption prove to be fairly accurate, then 1953 will go down in history as the year in which aluminum succeeded copper as the No. 2 metal.

* * *

WORKER CARELESSNESS: In this week's "Mirrors of Motordom" (p. 77), Floyd Lawrence cites a few instances of how simple mistakes along the assembly line can result in the shipment of an occasional defective car to dealers. Right now automobile manufacturers are forced to take extraordinary precautions against this type of trouble.

One of the basic factors in this situation is the carelessness of some workers. This undoubtedly stems from the acute labor shortage. It is estimated that in Detroit alone, 20,000 more employees are needed right now. This means that there are untold hundreds of men and women employed on jobs they couldn't hold if real competition for jobs existed. The only immediate relief lies in better supervision, more adequate training and painstaking inspection.

* * *

CHANCE FOR INDUSTRY: Last week the Atomic Energy Commission indicated that as a result of several years of study it has formulated a policy which is intended to permit a wider opportunity for private investment in building and operating plants to produce electric power. Details of the policy will be studied by the Senate-House atomic energy committee and in due time hearings on the subject will be conducted. The Eisenhower administration previously had endorsed the peacetime use of atomic energy in principle.

The initiative of AEC in laying the ground work for the participation of industry in the application of atomic energy to nonmilitary uses is commendable. The next step is to draft legislation that will be fair and practical.

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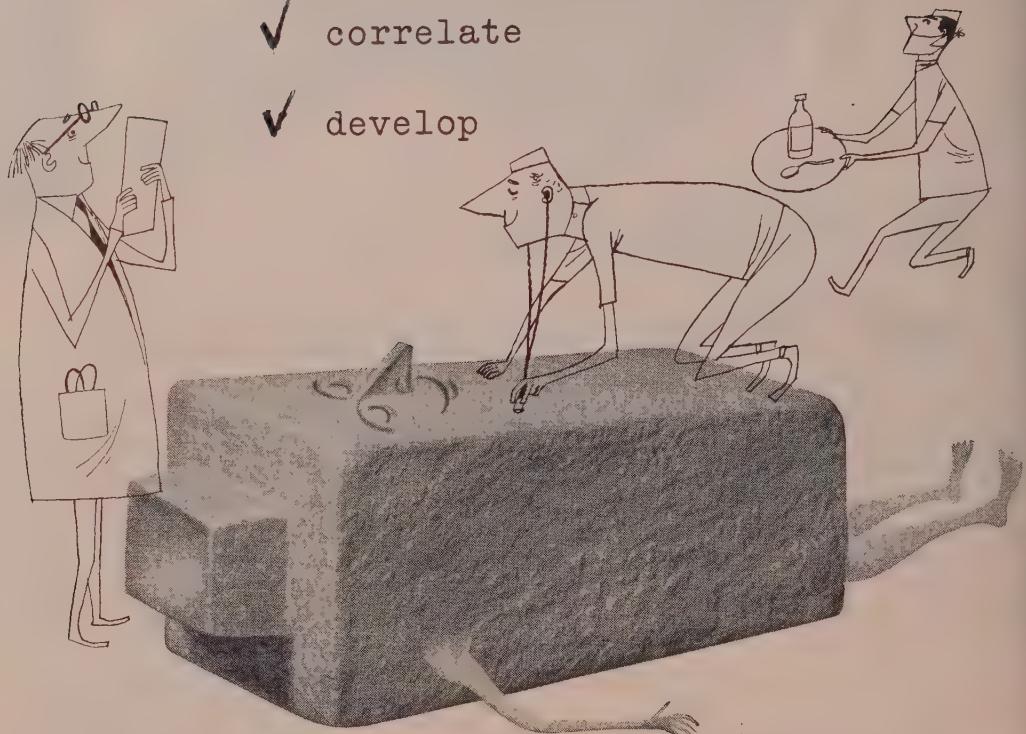
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HOW METAL SUPPLY-DEMAND LOOKS FOR 1953

NET TONS	STEEL*	COPPER [†]	ALUMINUM [†]
POTENTIAL SUPPLY	118 MILLION	1.6 MILLION	1.5 MILLION
ESTIMATED DEMAND	114 MILLION	1.4 MILLION	1.5 MILLION

*INGOTS [†]INCLUDES PRIMARY AND SECONDARY DOMESTIC METAL, PLUS IMPORTS

Glut in Metals, but Supply-Demand Balance Nears

LOOK in the economic crystal ball today indicates that a supply-demand balance in copper is about here now; it will occur in aluminum midyear and stay in or near balance for the rest of the year; it will take place in steel in the fourth quarter when the ingot rate will drop as low as 90 per cent capacity.

The above table indicates that the excess aluminum will be available in 1953. There's some excess copper now. The steel shortage will continue steadily but will still continue through the third quarter. If substantial tonnages of steel go begging this year, such a situation won't result until the fall and winter months.

Prospects — Thus, chances are there'll be no glut in steel or aluminum during 1953. Even in copper, the excess of supply over demand is not yet alarming. All current estimates are predicated on the assumption that no major strikes will be pulled among big producers or consumers and that an all-out war will start. The estimates hold even if peace comes to Korea or no Korea, defense spending will continue high for the cold war, and civilian demand will take up the slack if military expenditures do drop slightly.

Steel—We're producing — and consuming — steel now at the rate of nearly 10 million ingot tons a month. Order books for the second quarter are as heavily loaded as ore boats starting down the

lakes from Duluth. Third quarter bookings are coming in nicely, but the vacation season in that period will probably whittle the ingot rate to about 98 per cent of capacity for July, August and September. In the last three months of 1953 the outlook is haziest, yet even at a conservative 90 per cent of capacity for October, November and December, the ingot rate during the year would still be a healthy 97 per cent average.

That would mean all-time record production of 114 million ingot tons, compared with 93 million in 1952 and 105 million in 1951, the actual peak thus far.

Copper—Price is the key to the supply-demand situation in copper. Few fabricators are crying for copper today; it's doubtful that all April allocations (135,000 tons) will be used. That's not because consumers don't want the metal, but because they don't want it at 34 cents and higher. Domestic copper now brings about 30 cents, foreign about 34. A one-price level in copper at 30 cents would probably lure consumers to take all of the 1.6 million tons that will be available from every source, but it will require some time for the foreign quotations to drop four cents.

Even so, consumption this year will be about 1.4 million tons, slightly better than the 1,389,000 tons consumed in 1952. More copper will be available this year than last because of an estimated 165,000-ton increase in production of

free-world mines and an expected jump of 15-20 per cent in imports of the metal.

Aluminum—A tipoff that supply and demand are evening up for aluminum is that imports (immediate delivery at slight or no premiums) go begging. Canadian, British, French, Norwegian and Italian metal is on the market today. But orders are extended for domestic mills—12 to 20 weeks for sheet. Even if many orders are only placed as supply insurance, aluminum producers figure they're in excellent shape until midyear.

They think they're in good condition for the rest of the year, too. After CMP folds, increased civilian use and renewed stockpiling at a heavy rate will take a lot of metal. Producers claim that with potential volume users such as the auto industry, it's not a question of whether they'll use more aluminum, but when. The when depends on supply assurance, and that assurance may be forthcoming this summer because civilian industry will have about 300,000 tons more aluminum this year. So even if the military bite on aluminum slips, enough consumption can be generated to take the 1,250,000 tons of primary output, the 150,000 tons of imports and the 100,000 tons of secondary production expected this year.

Crux of the Matter—The real key to demand for steel, copper and aluminum is civilian requirements, not military. The defense bite in

1953 will be only 12 per cent on steel, 20 per cent on copper and 25 per cent on aluminum.

And the crucial factor in civilian markets is automobiles. Pessimists claim the automakers can't keep it up, but those manufacturers have fooled the soothsayers before and they're currently producing at a near-record rate of 6.5 million cars a year.

High Alloy Casters Worried

Members of the high alloy steel castings industry informed the National Production Authority that additional quantities of primary nickel or nickel alloy purchase scrap must be made available to the industry if it is to meet requirements of its customers.

The industry, which is composed mostly of small business concerns, is unable to meet the competition of other metalworking industries for scarce nickel scrap since price ceilings were removed. The price has nearly doubled since then.

The committee members estimated that at least 25 per cent of their nickel requirements should come from scrap. In 1951, they obtained a peak of 54 per cent from that source, but in December, 1952, they dropped to a low of 4 per cent.

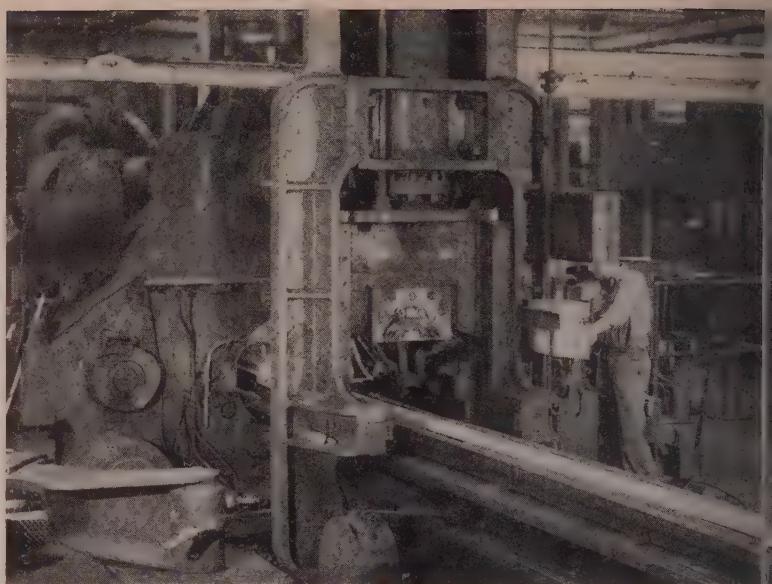
Wheland Gets Large Write-off

Wheland Co., Chattanooga, Tenn., received the second largest certificate with the highest percentage of fast amortization granted by Office of Defense Mobilization from Mar. 12 to Mar. 25. In all, 148 certificates for new or expanded facilities worth over \$204 million were issued.

Wheland's certificate was for an alumina plant costing about \$22 million, of which 85 per cent will be allowed rapid tax amortization. Site of the plant has not yet been disclosed.

The other two of the top three certificates were to chemical companies for additional facilities to produce phosphatic fertilizers used in food production. More than half the certificates were for less than \$250,000; 66 were for small businesses.

Total value of certificates issued to date is \$25,681,973,000, for 16,191 new or expanded facilities.



SINCE WORLD WAR II HARVEY HAS MADE ALUMINUM EXTRUSIONS
... it's also experimenting with steel extrusions in this same type furnace.

Harvey Integrates Aluminum Operation

The company launches a program that will put it in mining, refining and additional fabrication activities by the end of next year

HARVEY ALUMINUM Division of the 40-year old Harvey Machine Co. Inc., Torrance, Calif., promises to become the major part of the Harvey operations soon.

Now scheduled or underway are these projects which will add to Harvey's aluminum facilities: South American bauxite mining, an experimental plant for extraction of alumina from clay, an aluminum reduction plant, a \$20 million aluminum rolling mill and a heavy press program. The company will eventually have an annual primary aluminum capacity of 54,000 tons annually and will be the nation's sixth producer. (For details on total industry expansion, which will mean production at an annual rate of 1,650,550 tons by mid-1954, see STEEL, Mar. 23, p. 58.)

Integration—As part of its plan for future integration of aluminum producing facilities, Vice President Laurence Harvey says the company is negotiating for bauxite bearing property in British Guiana and plans to conduct large scale mining operations there. It wants domestic raw material sources, too. A

step in that direction was acquisition of the government-built experimental plant at Salem, Oreg., where study will continue on processes to extract alumina from the clays of the Columbia river basin and for the processing of industrial chemicals.

If Harvey is successful in operating economically on the 30 percent average yield of alumina expected from the clays, it will have a fully integrated domestic production system. The high 70 percent refuse rate compares with about 45 per cent encountered in South American bauxite.

Keystone—The biggest factor in integration for the company is the proposed reduction and refining plant at The Dalles, Oreg. Construction is scheduled to begin within 6 months there on the facility which will have the capacity to produce 54,000 net tons of aluminum per year after it is completed by the end of 1954. A certificate of necessity for \$65 million was granted last December for the privately financed plant.

Low-cost electric power is

ed Harvey in picking Oregon as site for its reduction plant. This factor influenced other aluminum producers, too, and the Pacific Northwest now accounts for 33 per cent of the nation's primary aluminum capacity. To get its power from the Bonneville Power Administration, Harvey is not expected to aggravate the electricity shortage in the Columbia river region because by the time its plant is into production there will be enough new generating capacity.

Fabricating—Harvey is already substantially involved in aluminum fabrication. Since 1945 when it started an aluminum extrusion division in Torrance, steady growth has shot that division into third place among the nation's producers of aluminum extrusions. The company markets its extrusions to both civilian and defense customers in about equal proportions. A large military use has been for wings and fittings in Air Force and Navy aircraft.

The already established fabrication part of Harvey's activities in aluminum will be rounded out with a 20 million continuous strip mill in Torrance for rolling 60-inch hot strip. The mill, including special equipment for the treatment of aircraft alloys, will be the first such facility in California. To produce aluminum sheets, strips and circular shapes, the mill is part of the expansion plan set by the government for increasing aluminum output close to West Coast aircraft plants which will 60 per cent of the U. S. needs. Completion of this facility is scheduled within 18 months.

Heavy Side—Also planned for early construction in Torrance is a heavy forging and extrusion press plant of 600,000 square feet for production of large, high strength aircraft structural components. The facility will house four of the 19 heavy presses in the Air Force aircraft program.

The fabricating part of Harvey's aluminum business will eventually be clustered around Torrance—the new facility in a new 65-acre area adjacent to more than 100 acres, with the site of the regular extrusion division and two other Harvey divisions and soon to be the site of a new mill.

Eisenhower Courts Congress

Congressional scoreboard shows the President's proposals usually meet favorable but cautious consideration. But his recommendations on controls and taxes stir opposition

HOW IS President Eisenhower faring in his efforts to win the good will and co-operation of Congress? The answer is: Fairly well. Of his 19 requests to Congress to date, two have been granted and one rejected. Partial action has been taken on five others. No action has been taken on the remaining 11.

Congress granted the President's request for extension of authority to reorganize executive departments, subject to rejection of individual reorganization plans by Congress. A second request allowed was for revamping the Federal Security Administration and establishment of a Department of Health, Education & Welfare.

Thumbs Down—Congress turned down a presidential proposal to reject "interpretations" of commitments contained in secret understandings with foreign governments which permit enslavement of

peoples. Congressional leaders thought the resolution should call for "repudiation" of these secret agreements, and in the resulting confusion the matter was dropped.

Hearings have been held on Taft-Hartley amendments, on rent control renewal and on renewal of defense priority and scarce material controls. The Senate Banking Committee has put finishing touches on a measure — S. 1081 — which would continue until June 30, 1955, authority for priorities and allocation of critical materials.

Continued Controls — Entitled "Defense Production and Temporary Controls Act of 1953," the bill would continue until June 30, 1955, government authority to encourage minerals and metals development and would give the Federal Reserve Board stand-by authority to that date to impose controls on housing and consumer credit.

A proposal to allow the President to freeze wages, prices and rents for a 90-day period in case of emergency and to grant Eisenhower's request to extend rent controls until Oct. 1, 1953, is under congressional consideration. Predictions are that the controls bill as now shaping up will pass the Senate but fail in the House.

A serious controversy may be developing in regard to taxes. The President insists the time has not come to reduce taxes, but there is a strong trend in the House to do just that. Another major difference is in reference to stand-by wage, price and rent controls. Eisenhower doesn't want such a law but many in Congress want it in case of all-out war.

Satisfactory Relations—Observers believe the President is receiving the normal amount of co-operation from Congress. His relations with that body are distinctly friendly. At the same time, difficulties to date (particularly opposition to his appointments of Charles E. Wilson and Charles Bohlen) prove that he is not dealing with a rubber-stamp Congress.



India Dedicates Its 'TVA'

Prime Minister Nehru (right) lauded American engineers and technical skills at the dedication of the first unit of India's Bokaro steam power plant near Calcutta. Listening was Harry A. Kuljian (left), Philadelphia engineer, whose firm designed the \$35 million power project on the Damodar river.



Fastener Sales Climb



Fastener manufacturers enjoy heavy sales to jobbers, automakers, but lags may develop this year, particularly in rivets



"GOOD FOR THIS year, but with sore spots in the future"—that's the outlook in steel fasteners, an industry which consistently mirrors general business conditions. Manufacturers will clamp down good sales this year, better than last, but their hold on the market may loosen in 1954.

Steel supplies are improving, there are no fundamental defects in the fastener trade and industry expects a record dollar volume of construction in 1953, pointing to a successful year. When industry builds, it needs nuts and bolts, screws and rivets to hold installations together. However, demand is falling off among such good customers as the railroad industry.

More for Autos—On the brighter side, Detroit is buying fasteners in record quantity for accelerated automobile production. The aircraft industry needs more nuts and bolts for engines, and structural steel enterprises continue to be heavy buyers of rivets.

Auto manufacturers will continue to use greater numbers of fasteners for production and repair this year, the Industrial Fasteners Institute reports. Detroit uses many special designs of headed and threaded products, besides being great users of standardized types. The average car, with 15,000 parts, has thousands of fasteners. Of one type of screw, General Motors Corp. uses above 100 million a month. Chandler Products Corp., Cleveland, says demand for the company's bolts from the motor city is 25 to 50 per cent above last year's sales.

Jobbers—Auto mechanics, needing very small amounts of fasteners at one time, customarily buy from automotive replacement jobbers. Most of these purchase fasteners from manufacturers in standard packages. Jobbers are finding a steadily improving market in auto and truck dealers, service stations,

companies maintaining their own trucks and repairers of tractors and farm equipment. Replacement of parts will continue to be profitable as more equipment comes into use, and used more often.

Another growing customer for fasteners is the aircraft industry. Stainless steels, heat-resistant to withstand high temperatures in jet planes, are being developed for engine bolts. Although production schedules may be stretched out, aircraft sales should be high for several years. A switch from military to civilian production wouldn't affect fastener-makers greatly.

Mechanization of Farms—As farm machinery takes the place of the horse, farmers require more nuts and bolts for repair to trucks and tractors. Their work is done under rough conditions, so replacement parts are needed steadily. Farm machines use at least 5000 types and sizes of fasteners.

While the sales outlook is encouraging in the immediate future, troublesome forecasts are being made, particularly by rivet producers. Champion Rivet Co., Cleveland, states that sales to railroad companies for freight car construction are below par. A Pittsburgh manufacturer says his sales to structural steel enterprises are falling off. "There was a flurry of rivet sales after the steel strike ended, but now a downturn is starting," a midwestern operator reports.

Pressure for Sales—Working quickly to prevent a recession, manufacturers of rivets are trying to bring about savings of materials in production, while increasing sales campaigns. "Supplies, such as wire, have improved," says Milford Rivet & Machine Co., Milford, Conn., affirming the general opinion that sales are the greatest problem.

A shot in the arm for the fastener industry is the accelerated use of high tensile bolts. Rivets and

common bolts are usually made carbon steel. High tensile bolts heat-treated steel are turned very tight with a torque wrench air-driven impact wrench. The clamping force between bolt and nut holds steel joints together very firmly.

High tensile bolts are being used in bridges where service conditions are severe and in field construction.

Business Conditions—Consensus among fastener manufacturers is shown by this typical comment: "We feel that business will continue to be there, but after this year, we'll have to exert more sales pressure to go after it."

Manganese Research Widened

"Wad" ores of New Mexico and Arizona are now included in the government's attempt to find an economical method of converting low grade domestic manganese ore to a product that can be used by the steel industry.

The contract for the research between Defense Materials Procurement Agency and Southwest Engineering Co., Los Angeles, formerly included only wad ores from Virginia and Arkansas and Aroostook manganese deposits in Maine. There are large deposits of wad ores in the United States. If a practical method can be found to separate the small particles of manganese from other materials in the ore, it will help reduce American dependence upon foreign sources for the important metal.

The U. S. now uses about 2 million tons of manganese a year, about 90 per cent of it imported.

President Favors Trade Act

President Eisenhower favors a one-year extension without major changes of the Trade Agreement Act, due to expire June 12. He says there isn't time enough for the study which a complete revision would require.

House Speaker Joseph Martin (Rep., Mass.) says he, too, feels that a one-year extension is in order. The House Ways & Means Committee will begin hearings on Apr. 22 on H.R. 4292 which would extend the act for one year and reduce the President's discretion in dealing with tariffs. It would make

mandatory instead of optional him to accept recommendations the Tariff Commission in regard to peril points and damage to nestic industries through undue iff reductions.

Security Regulations Clarified

The matter of security in plants ing defense contract work came for clarification by the Munitions Board last week. It ruled at a defense contractor cannot invoke a "restricted" or "confidential" security clearance granted employee even if the contractor ids the employee to be a security k.

The proper procedure is for the ployer to pass his evidence on to the contracting officer. He must en wait for action until he hears om the contracting officer or the my, Navy or Air Force Personal Security Board.

Munitions Board also approved duction to pulp as an alternate method to burning for destruction

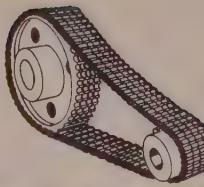
printed or written classified curity information. Security officers will designate the type of upment which may be used for is purpose.

Finally, the secretary of defense as directed that the Armed Forces Industrial Security Regulation approved by the Munitions Board Jan. 15, 1953, be adopted as a regulation of the Department of Defense, thus establishing a single regulation for the industrial security policies and procedures of the three armed services.

How To Start Rolling

Dow Chemical Co.'s program to concentrate all magnesium rolling and extrusion facilities at its Madison, Ill., operations will have the heavy rolling equipment operating his fall with the other additions scheduled for completion by mid-954.

The new setup at Madison includes alloy ingot production facilities and warehouse area. Extrusion equipment includes press capacities of 13,200 tons down to 250 tons. Four-high rolling mills will be used. Coil rolling equipment includes an 84-inch, four-high, hot-breakdown mill and 84, 68, 66, 36, and 18-inch, four-high, mills for cold finishing.



Chain Drives

Heavier Loads, Faster Speeds Are Still the Coming Trend

"WHEREVER there's a smoke-stack, there's a chain used."

That's an old saying in the transmission chain industry which is taking on a new meaning in 1953. With the exception of the six months prior to Korea, the industry has enjoyed a seller's market since World War II. This year, chain makers look for a change to a buyer's market; every smoke-stack will then represent a customer worth going after.

Shooting for Par — Increased competition should not hurt sales, though. Dollar sales this year are expected to be on a par with 1952, or a little better, chain makers report. In 1952, sales were up 20 per cent over 1951 in some cases.

Since Korea, sales have been tied closely to materials supplies. Defense needs and then the steel strike cut into the materials available and thus into sales. Now, steel is becoming noticeably easier; the worst that can be said is that some items are in spotty supply. These would include high carbon plates, high carbon bars, certain strict analyses of strip, and specialties like monel, stainless steel and nickel-bearing grades.

Heavier and Faster — How are transmission chain manufacturers planning to meet the day of better steel supply and increased competition? Mainly, through product improvement. While industry-shaking new developments are a rarity in the chain drive industry, constant improvement and modification is the rule. There is a continuing trend toward chain which will transmit heavier horsepower loads at faster speeds. Morse Chain Co.'s Hy-Vo chain has reportedly transmitted between 1000 and 2000 hp at speeds up to 6500 feet per minute, says I. A. Horton, sales promotion manager for the company. This type of chain, a modified silent chain, hasn't become standard

yet but may some day soon. Other companies report they, too, are working on chains to deliver heavier loads faster.

Non-sparking, non-corrosive, non-magnetic chains are being developed; alloy steel chains for longer life; interchangeable hubs for sprockets are now available.

Steady Prices — They all add up to better performance for the customer, and a slight competitive edge for the manufacturer. Price cutting is another customary sign of tight competition. There are no indications that chain makers are using this expedient yet, however.

About 25 companies make drive chain—five major manufacturers of silent chain, six makers of roller chain and four producers of heavy engineering chain. The remainder are component or lesser producers. Distribution of chain varies with the section of the country being considered. For example, in New England, about 30 per cent of drive chain production is sold through mill supply or industrial supply houses. In the Detroit area, much of the chain is sold through manufacturer's agents and, for the Midwest as a whole, about 60 per cent of the chain goes directly to original equipment manufacturers.

Buoyant Market — Over-all, new equipment is a large user of drive chain and that is one reason for continued buoyancy in the chain market. As George Bee, sales manager, Palmer-Bee Co., Detroit, puts it: "Management has given large appropriations for plant equipment and improvement. That's where chain comes in."

Does the prospect of increased competition have chain makers worried? "The outlook for 1953 is very good," says R. H. Sager, general manager, Simonds Gear & Mfg. Co., Pittsburgh. And most chain makers roll right along with that opinion.



Rebuilding Machine Tools at Boeing Plant

Careful checking and testing plays an important part of Boeing Airplane Co.'s tool rebuilding program. About 17 World War II machines are rebuilt in the company's Wichita, Kans., division each month. New production line procedures help restore old, worn machines to original specifications at a low cost

Good Business Ahead, if—

Machine tool builders, meeting in New York, are unusually optimistic, provided sound U. S. policies are adopted and the Vance plan is accepted

MACHINE TOOL builders are optimistic about their outlook, although realizing that heavy competition lies ahead.

"If the present administration fulfills its promise to encourage competitive enterprise and if initiative is rewarded, I think there will be a wave of intense competition such as this country has not seen in years." So said Swan E. Bergstrom, president of the National Machine Tool Builders Association in his opening address at the group's spring meeting in New York last week.

Lower Cost—"The big question the country over," Mr. Bergstrom continued, "will be: How can we get our costs down so that more people can buy our product? That is where the machine tool industry comes squarely into the picture. Our industry is the basis of all industrial productivity, and we have what it takes to cut costs."

Mr. Bergstrom, vice president of Cincinnati Milling Machine Co., Cin-

cinnati, cited such problems of concern to the industry as the need for revision of present Internal Revenue department provisions about depreciation and the necessity of removing restrictions which block sales of American-made machine tools to foreign countries. He also emphasized the need for revision of tax policies which discourage the venture of risk capital.

Shadow Plants—Together with the industry's interest in administration policies is its acceptance of the Vance plan. So far this is simply a report submitted to the Office of Defense Mobilization. Before it becomes official it will have to be approved by the armed forces and by Congress.

The plan proposes installation of "shadow plants" instead of building up vast supplies of planes, tanks and guns. Production equipment to fill the standby plants would be in the stewardship of a manufacturer and could be used for manufacture of peacetime goods while

awaiting conversion to defense production. Ralph S. Howe, executive vice president of New Britain Machine Co., New Britain, Conn., states that the plan would avoid stockpiling more than a reserve to withstand the first impact of war.

No Emergency—This plan suggests that national defense is not an emergency proposition but may be a continuing problem to face in the future. Tool builders feel that the Vance plan, or one like it, will be the answer to their problem. They are overwhelmingly opposed to wholesale stockpiling of machines, partly because the machines are often obsolete before they can be brought into service. (For more details on shadow plants, see p. 71.)

Many machine tool order boards show a trend away from deferment of goods into the consumer field. At present the split is about 50-50. One large manufacturer says that incoming orders are about 60 percent civilian.

The industry is hard at work now on standardization plans. Tell Benner, general manager of the association, reported on work in the field of electrical, hydraulic and mechanical press, hydraulic and training standards.

New Controls Taking Shape

The controls picture after June 30 is getting more shape as National Production Authority prepares two more orders. The first will be a revision of Regulation 1, the inventory control order, which will be issued soon.

In effect, the revision will eliminate inventory controls over most of the materials not covered by the Controlled Materials Plan, thus conforming to the new criteria for retaining controls over only those commodity areas in which the impact of military demand has created a strained supply situation.

The second action will be to revise NPA Order M-103 to limit the percentage of the output of diamond abrasive wheels which will be earmarked for defense orders. At present, the entire output goes for defense.

Both revisions will be issued as NPA orders, but they are being written with a view to continuation after June 30 under the Defense Materials System.

Central Tool Board

Congressional proposal would minimize waste of U. S. machine tool inventories

UCH-DISCUSSED proposal to establish a governmental central machine tool agency has been referred to President Eisenhower, who assigned a staff assistant to an investigation.

In a letter to the President, Rep. George Shafer (Rep., Mich.), chairman of a House Armed Services Committee, pointed out that the government owns more than 500,000 machine tools and other items of production equipment, representing an outlay of about \$6 billion of taxpayers' money.

Asked Equipment?—Rep. Shafer says that facts brought to the committee's attention raise the question of whether this equipment is being used with full effectiveness.

There have been instances, continues, where the armed services purchased tools although the government's inventory of idle tools contained identical items.

Specifically, Rep. Shafer asked President, if findings warrant, to appoint a special committee to see that tools owned by the government are used effectively.

Permanent Board—This committee, Rep. Shafer suggests, may be the best approach toward that to be creation of a "central machine tool board" or "central production equipment board." The group would inventory, catalog and maintain government-owned equipment, lease it to contractors, including allocation to government plants, and possibly handle all government procurement of such equipment.

Rep. Shafer will not schedule committee hearings on the proposal until he has a definite reply from the White House.

negotiation Rules Changed

Manufacturers involved in subcontract sales of machine tools and long-lived equipment will be restricted in Staff Bulletin No. 7 in which the Renegotiation Board extends the processing of cases under the recent change in its regulations.

The change reduces the part of



For Service Call 3033

Two-way radio communication is an innovation in overhead cranes at the Georgia Division plant of Lockheed Aircraft Corp., Burbank, Calif. Speeding production of Boeing B-47 Stratojet bombers, radio equipment permits quicker dispatching in the 45-acre plant. A telephone call to the radio control booth brings quick service

the subcontract price which is subject to renegotiation by taking into account the percentage of time that the equipment is expected to be used in renegotiable production during the first 12 months following its delivery to the user.

Staff Bulletin No. 16 explains the board's ruling that when a defense contractor is required to refund excessive profits to the government, he may pay the refund in installments when payment in a single sum would impose undue hardship. Both bulletins are available from the superintendent of documents, Government Printing Office, Washington 25, for 5 cents apiece.

SELECTED DEFENSE CONTRACTS IN EXCESS OF \$100,000

PRODUCT

Trucks, Fork, Gasoline
Tractors, Crawler
Motor Vehicle Parts
Combat Vehicle Parts
Shells, 135 mm
Shells, 105 mm
Shells, Mortar, 81 mm
Bombs
Range Finders
Fuzes
Aircraft Pumps
Primers & Carburetors
Cylinders
Pumps for Ships
Tube Axial Fans
Kit Heaters, Personnel
Elevator Machinery
Lockers
Radiographic Units

CHECKLIST ON CONTROLS

Materials Order

TUNGSTEN STEEL—Simultaneous revocation on April 6, 1953, of Schedule B of NPA Order M-80 and NPA Order M-81 removed restriction on monthly production of high speed steel containing a high tungsten content and abolished use control over pure tungsten and pure molybdenum.

Mineral Order

ZINC EXPORTS—Revocation of Mineral Order 3 on April 3, 1953, removed controls over the exporting of zinc.

Appointments in Washington

J. B. Coffinberry, Republic Steel Corp., was appointed chief of the Sheet, Strip & Tin Mill Products Section, Iron & Steel Division, National Production Authority.

Kenneth M. Smith, National Malleable & Steel Castings Co., Cleveland, was named chief of the Castings Section, Iron & Steel Division, NPA.

George A. Sands, Electro Metallurgical Co., New York, was appointed assistant director for ferroalloys, Iron & Steel Division, NPA.

W. P. Gideon, Tennessee Coal & Iron Division, U. S. Steel Corp., was designated chief of the Plate Section, Iron & Steel Division, NPA.

Fred G. Brown, Weirton Steel Co., was named chairman of the Production Directive Committee, Iron & Steel Division, NPA.

James M. Mitchell was appointed civilian deputy to the assistant secretary of defense (manpower & personnel), Department of Defense.

Kenton R. Cravens, St. Louis, was named administrator of the Reconstruction Finance Corp.

Trims Justice Department

Most impressive purge by the Eisenhower administration to date has occurred in the Justice department. Upwards of 60 attorneys have been dismissed from its staff and the ousters are continuing.

Attorney General Herbert Brownell is recruiting a new staff on which he can rely to carry out administration policies to the letter.

CONTRACTOR

Yale & Towne Mfg. Co., New York
International Harvester Co., Chicago
American Generator & Armature Co., Chicago
Minneapolis-Honeywell Regulator Co., Minneapolis
Westinghouse Electric Corp., Pittsburgh
National Pressure Cooker Co., Eau Claire, Wis.
Lloyd Mfg. Co., Menominee, Mich.
Temco Inc., Nashville, Tenn.
Chrysler Corp., Detroit
Supreme Knitting Machine Co. Inc., Brooklyn, N. Y.
Thompson Products Inc., Cleveland
Bendix Aviation Corp., Detroit
Besler Corp., Emeryville, Calif.
Warren Steam Pump Co. Inc., Warren, Mass.
L. J. Wing Mfg. Co., Linden, N. J.
Stewart-Warner Corp., Chicago
Westinghouse Electric Corp., Pittsburgh
Bristol Sheet Metal Co., Middletown, Conn.
Westinghouse Electric Corp., Pittsburgh

Defense department studies optimum use of shadow plants and multiple-source plants. Congressional economy drive may cut into scope of the mobilization base

CONGRESSIONAL efforts to cut \$4 billion from the defense program may mean revising the scope of the mobilization base downward. "Shadow plants" and "multiple-source" plants are involved.

At least 50 shadow plants are on the boards—including ten to 12 for building "elephant" machine tools, ten to 12 foundries capable of producing cast steel armor, several gage plants and about six plants for producing forgings for ship propulsion machinery. In addition, a considerable increase in facilities for producing cutting tools is planned.

End-items — Multiple-source plants, like the tank plants that already have been created, would produce duplicate military end-items. They would be available for quick expansion in production of those items. Planners would have installations spread over the country to prevent paralysis of production in event of enemy attacks.

When Charles E. Wilson, defense secretary, was asked at a recent press conference about plans for cutting expenditures in his department, he said, "We don't want to spend the nation's money for something we don't need to do now. We are looking over expenditures carefully to avoid spending money for a big theoretical capacity that we may not need."

Fight Tariff Cuts . . .

A new lobbying group, attempting "the largest effort yet made to block tariff reduction," has been set up in Washington. Named the Nationwide Committee of Industry, Agriculture and Labor on Import-Export Policy, its chairman is O. R. Strackbein, 815 15th St. N. W., Washington.

Among industries represented are chemicals, coal, dairy products, glassware, bicycles and wool production. The committee will wage a grass-roots campaign, con-

tact Congress and undertake an educational program of radio and TV addresses to win public approval of its objective, prevention of further injurious lowering of tariffs by the government.

Heads Atomic Energy Group . . .

Newly-elected successor to the late Brien McMahon as chairman of the Joint Congressional Committee on Atomic Energy is Rep. W. Sterling Cole (Rep., N. Y.). Under a rotational arrangement Mr. Cole will serve for the remainder of this Congress, to be succeeded for a two-year period by a member of the Senate.

FTC Speed-up . . .

"We must speed up our procedures and dispose of cases promptly." That's the word from the new chairman of the Federal Trade Commission, Edward F. Howrey. Saying that the efficiency of any organization is dependent upon the morale, loyalty and earnestness of its employees, he called on the commission's personnel for teamwork "to keep advertising truthful, to prevent false and deceptive trade practices and to halt monopolistic tendencies."

Mr. Howrey added that he subscribes to the high purposes for which the commission was established and the laws which it administers.

Review Social Security . . .

The entire social security system will be studied by a new House Ways and Means subcommittee preparing revisions to be submitted to Congress in 1954.

Another subcommittee will conduct a parallel study of the unemployment compensation insurance program for revision next year. Meanwhile the White House is preparing a request that Congress ex-



Proposed ODM Chief

Arthur S. Flemming, on leave as president of Ohio Wesleyan University, was nominated as director of the Office of Defense Mobilization by President Eisenhower. The Senate is expected to confirm his appointment. Under a presidential proposal, ODM would become a statutory agency with functions of the National Security Resources Board and authority to fix governmental stockpiling policy.

tend old-age and survivors' insurance to farmers and professional classes not now covered.

Funds for Fellowships . . .

The National Science Foundation awarded 556 graduate fellowships in the natural sciences for the academic year 1953-54.

Stipends to fellows range from \$1400 for the first year of graduate study to \$3400 a year for first doctoral fellows.

Agriculture Cuts Costs . . .

Responding to the President's request for economies in all government departments, Secretary of Agriculture Ezra Benson has cut \$130.8 million from his budget for fiscal 1954.

The Truman budget called for \$1,324,600,000; Benson is asking for \$1,193,800,000.

■ Baker 6000-lb. Fork Truck stacks Ford engine blocks in temporary storage. Next move is to engine plant.



100th anniversary
1853-1953
THE BAKER-RAULANG CO.

New Ford Foundry speeds handling. with BAKER TRUCKS

■ A sizeable fleet of Baker 6000-lb. capacity Fork Trucks helps maintain the production pace in the new Cleveland Ford foundry. The trucks are of the "FT" type, designed for 100% functional, efficient, safe, low-maintenance operation. They are used interchangeably on a wide variety of jobs, moving many materials that cannot be piped, conveyed or transported by other automatic methods. Most such materials are palletized for fork-truck handling.

They unload incoming bulk materials such as sea

coal, bond, drums of oil and other liquids, tier them in storage or in areas near their points of use. They haul supplies to metal and molding departments and to other production operations. They haul finished products from ends of production lines to scales for weighing, and then to storage. Palletized engine blocks are taken from conveyors to temporary storage awaiting transfer to adjacent engine plant. They load cast flywheels onto highway carriers for shipment to the Ford Rouge plant.

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your copy of the "Baker Handling Library", a portfolio of case histories showing actual cost savings in foundries and other plants.

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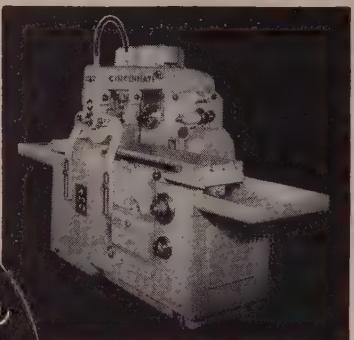
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Material Handling and Construction Equipment

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NEW **Cincinnati**
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Plain style, CINCINNATI No. 2-24 Automatic Milling Machine.

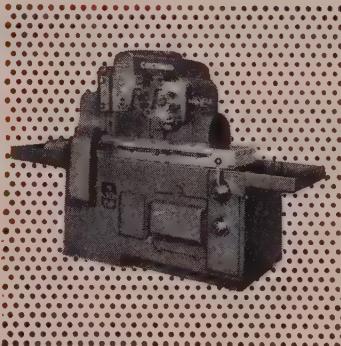


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NEW **CINCINNATI**
NO. 2-24
AUTOMATIC

Duplex style, CINCINNATI No. 2-24 Automatic Milling Machine.



Plain Rise and Fall style, CINCINNATI No. 2-24 Automatic Milling Machine.



"What does the customer want?" These words have always guided Cincinnati Milling's machine design policy, from first knee-type built 69 years ago to latest bed type... the No. 2-24 Automatic. These new machines combine advanced production features with more convenient means of setting up the job. They are built in three styles: Plain, Duplex, Plain Rise and Fall. All have...

Automatic Two-Way Table Feed Cycle for one-way milling; for reciprocal feed, with midway safety stop position. Controlled through...

Cycle Selectors, a small cam shaft which can be removed and replaced in less than a minute. Units have been designed for almost every conceivable automatic cycle. In addition to table feed, spindle carrier, cycle selectors include other automatic functions including...

Automatic Backlash Eliminator—It automatically engages during feed stroke and automatically releases during rapid stroke. Another feature of value in modern metalworking practice is...

Automatic Spindle Stop—When the table stops for loading and unloading the fixture, the spindle stops rotating. These production advantages gained through these automatic features, add...

Single Control Lever—Starts the complete automatic cycle, and controls...

Power Manual Traverse of table and spindle carrier; a labor-aiding convenience for setting up the machine. To top it off...

Dynapoise Overarm, a built-in feature which chokes self-excited chatter, smoothing out the cutting action.

With new CINCINNATI No. 2-24 Automatics in metalworking shops everywhere come to reduce the cost of milling operations, with 3 hp and 5 hp range, on a wide variety of parts manufactured in medium to infinite quantities. For brief data, look in Sweet's Catalog File, or if you want complete information, write for new 28-page catalog No. M-1760.

THE CINCINNATI MILLING MACHINE CO.
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MACHINES • METAL FORMING MACHINES • FLAME HARDENING MACHINES
OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

STRATEGIC MATERIALS—

We Depend on Foreign Sources for These Amounts



Source: Defense Production Administration and U. S. Bureau of Mines

S. Leans on Foreign Raw Materials

Defense Production Administration figures show the trend toward U. S. dependence on foreign materials is continuing. Opening new sources of supply brings investment problems

MANUFACTURING colossus the world may soon be standing on shaky legs. Through a combination of rapid importation of domestic raw materials and technological developments which demand new materials, American manufacturers come to lean on foreign-produced supplies. This country became a net importer of raw materials during the 1940s. In 1950 weight of dependence had increased and is likely to increase further. Each year 2.5 billion tons of raw materials are used to support our high standard of living.

lagging Investments—Yet, investments in foreign sources of raw materials have lagged behind. The President's Materials Policy Commission (Paley commission) estimates that, for copper requirements of U. S. industry alone, an annual investment aboard of \$100 million will be needed over the several years. U. S. private investment in foreign mining and trading activities since World War II has averaged only approximately \$50 million a year.

To point up the discrepancy, the Defense Production Administration has reported the percentages of total U. S. consumption which are based on imports for certain strategic materials (see the chart).

Unobtrusive But Important—Uses and sources of some of the materials listed are not as apparent as copper, lead and tin. Columbium, for example, comes chiefly from Nigeria and, in alloy form, is used in jet engines, gas turbines, rockets and similar devices. Limenite, supplied to us mostly from India, is the principal ore of titanium along with rutile. Mica coming from India and Brazil in muscovite mica, block film and splitting form and from Madagascar and Canada in phlogopite mica form, has multiple uses in electronic tubes, mica capacitors, magnetos and electrical insulation. Manganese, from India, nickel, from Canada, and tungsten, from Bolivia, Portugal, Spain, Brazil, Thailand, Malaya, Burma, Korea and Australia, all have important uses in steelmaking.

The U. S. government is trying by several methods to insure and

increase American investment in foreign sources of raw materials. And U. S. industry is responding where it is economically feasible to do so. But, one of the biggest obstacles to overcome is the feeling of independence on both sides of the oceans.

Aries Goes to Tokyo

Titanium dioxide will be produced, beginning in late 1953, under an agreement between Nippon Titanium Co. Inc., Tokyo, and R. S. Aries & Associates, New York. Nippon Titanium already is one of the larger Japanese producers of this pigment, but the Aries process makes high quality production possible with smaller plant capacity.

The agreement provides for stock ownership participation in the Nippon company by Aries.

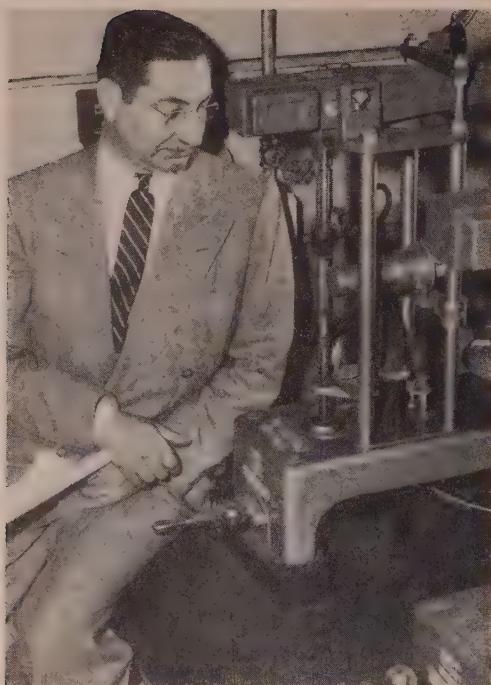
U.S. Furnaces for Australia

James H. Knapp Co., Los Angeles, shipped two heat-treating and aging furnaces to the Commonwealth Aircraft Corp. Ltd., Port Melbourne, Australia, to be used in manufacturing aircraft for the Royal Australian Air Force. Ever since World War II, when Australia was practically cut off from the rest of the free world, that country has been trying to become industrially independent.

The furnaces consisted of an aluminum heat-treating quick-quench furnace and an aluminum aging oven. Both were shipped completely bricked, although they weighed 37 tons and 7 tons respectively.

Offshore Pickups

Television is hitting its stride in Italy, say Westinghouse Electric Corp. representatives there. Sixty thousand receiving sets are expected to be in operation by the end of 1953, compared with about 5000 sets now in use. Still hurting from your bout with income tax? The German American Trade News says that last year a married man with two children paid a 6.2 per cent income tax on a yearly salary of \$3300 in the U. S. But, in the U. K. the same man, with the same income, paid 7.4 per cent; in France, 18.4 per cent and in Western Germany, 22.2 per cent.



Metallurgist John Redmond checks test results on a titanium carbide project in Kennametal Inc.'s research laboratory



How's work coming on that defense contract? Lt. Col. R. A. Jones pays a visit to John Redmond to talk over developments

Bringing Tomorrow Nearer—

A Metallurgist's Career

By ROBERT M. LOVE
Assistant Editor

"NERVE CENTER of his company's metallurgical development"—that phrase describes John Redmond of Kennametal Inc. As vice president, he controls and co-ordinates Kennametal's research and development in metals.

Testifying to Mr. Redmond's efficiency as a human control center are his firm's continuing achievements in production of cemented carbides. The Latrobe, Pa., company anticipates \$30 million in total sales this year, an increase of about \$2 million from 1952. Some 10,000 customers will pay about \$22 million for Kennametal's tungsten carbide cutting tools this year.

Careful Schedule — The metallurgist plans his daily activities to guide operations within his department and to contribute to efficient interoffice functioning. Kennametal's engineers and production men work closely with the research staff, and Mr. Redmond is responsible for keeping them up to date.

Such a task calls for supervising a maximum of separate and often unrelated operations with a minimum of confusion—getting all the work done, but first things first. The tall, soft-spoken vice president

achieves this by refusing to wait for reports to cross his desk. Instead, he checks on his numerous projects in person.

Work Begins—When this reporter called bright and early one recent morning, he found Mr. Redmond plunging into the day's work. First was an urgent telephone call from Washington—a request from an Air Force officer for a report on developments in jet engine parts. Mr. Redmond supervises development for defense activities as well as civilian production, the former accounting for about one-fourth of Kennametal's total production.

Among Mr. Redmond's varied projects is correlating research on raising inlet temperatures on jet engines, to increase power output. If temperatures within the engines could be raised from 1500 degrees to 2300 degrees, power might be tripled. The problem: Find materials best able to resist those temperatures.

Kentanium—Kennametal is now testing titanium carbide compositions, attempting to combine high temperature strength with thermal shock resistance. The answer may be Kentanium, whose essential in-

gredient is titanium carbide, with the auxiliary metal cobalt or nickel as conditions dictate.

After a concise telephone conversation, first of 25 or 30 during the day, Mr. Redmond turns to mail. One letter contains an Air Force contract having to do with the production of turbine parts. Planning for the contract poses problems for Kennametal's production and research departments. After planning how to co-ordinate his work, Mr. Redmond telephones Floyd Gerard, process engineer in the adjoining manufacturing building, and outlines the project.

No Ivory Tower—"There are a variety of philosophies of how to run a research department," the executive comments. "Some companies move their development staff away from the turmoil of the production department. Others, like Kennametal, want research closer to production. Here we are in the thick of things, and we benefit from close co-ordination with the rest of the company."

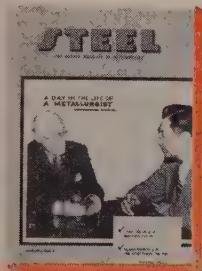
After starting work on the large projects, Mr. Redmond begins a series of talks with his six-man staff. Chief Chemist Charles Ham-



Charles Hanna, chief chemist, discusses chemical analysis he conducts under John Redmond's direction



One of many short meetings is John Redmond's brisk and informal talk with staff member J. W. Graham



ts out the necessity for a re-
on in an ore refining process.
asty talk follows with Philip
McKenna, president of Kennametal and chairman of the board.
New Applications — Supervising
nitude of projects requires
e watch for unexpected new
s for company products. Re-
ch done for the Army often
is up interesting possibilities
civilian work. Kennametal sci-
ents believe high temperature
positions developed for the Air
ce may have widespread uses
hot working of metal.
The skill with which a metal-
list operates depends largely on
well he keeps abreast of cur-
t events in metals," Mr. Red-
nd comments. His heavy sched-
of committee work includes
nbership in the American Insti-
e of Mining & Metallurgical En-
ers, the American Chemical So-
y, American Ordnance Associa-
n and the Pittsburgh Society for
alytical Chemists.

Washington Committees — Once
twice a month he drives to
hington, sometimes for a meet-
t of a committee of the National
sority Committee for Aeronau-

tics, on which he serves. The Army
conducts studies of armor-piercing
materials, another of his interests
as Kennametal produces antitank
projectiles.

A quick lunch interrupts Mr. Red-
mond's work, but he takes advan-
tage of the break to discuss planned
projects with members of the pro-
duction and engineering depart-
ments.

Back to Work — Two engineers in-
tercept John Redmond as he re-
turns from lunch. They report on
progress of a test with a turbine
impeller. Quickly the metallurgist
goes over test results with them.
Only then can he remove coat and
hat and return to an orderly pile of
papers on his desk.

Keeping in touch with the com-
pany's operations, Mr. Redmond
first reads a report from Kennametal's tungsten mine in Nevada
and from columbite mines in Brit-
ish Guiana.

The "Link" — A telephone call
breaks in on the reading. Mr. Red-
mond, as link between production,
engineering and research depart-
ments, is asked to order materials
for use in a research project.

Afternoon visitors arrive soon.
Although several would be satisfied
to talk with secondary officials,
John Redmond refuses to shunt
his responsibilities. "As long as I
co-ordinate the work, I should take
the responsibility of discussing it
with interested persons," he says.
One of the visitors today is an Air
Force colonel, on confidential busi-
ness. Another is a tool engineer
for an automobile company, asking
about quality control.

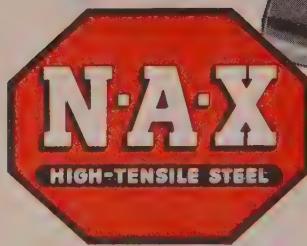
Company Objectives — Constantly
changing company policy calls
for frequent talks on research proj-
ects. Once a day Mr. Redmond's
staff meets with production and
engineering men to iron out common
problems and to correlate their ob-
jectives.

At today's meeting the staff con-
siders methods of building a ma-
chine to test experimental small
parts. To sell carbide inserts in a
tool, Kennametal frequently goes
far beyond the carbide or even the
tool design, showing potential buy-
ers how the company's products
will react to conditions of opera-
tion. "Sometimes we see a need
for a machine that doesn't exist,"
Mr. Redmond remarks. "We then
take it upon ourselves to get the
equipment designed, built and
tested."

Day's End — When the conference
closes, Mr. Redmond's working day
will be far from complete. Drop-
ping some papers into his brief
case, he plans to work at home un-
til late at night. "I don't mind late
hours when I realize what metal-
lurgical progress means to Amer-
icans," he says. "If a project looks
too big for us to attempt, we re-
member that industry's accomplish-
ments today seemed impossible yes-
terday. Yes, metallurgists have a
job on their hands."

This is the sixth in a series on what various
types of executives do on a typical day. For
others, see STEEL, April 14, 1952, p. 74,
on a purchasing agent; June 9, 1952, p. 72,
on a sales vice president; Aug. 18, 1952,
p. 75 on a company president; Nov. 10,
1952, p. 79 on an inventor-engineer, and
Feb. 9, 1953, p. 70 on a market research
manager.

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with Excellent
Cold-Forming
Properties**



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N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-carbon steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue toughness values at normal and sub-zero temperatures, and the abrasion resistance of a medium high carbon steel, resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult standard shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made lighter in weight . . . to longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

GREAT LAKES STEEL CORPORATION

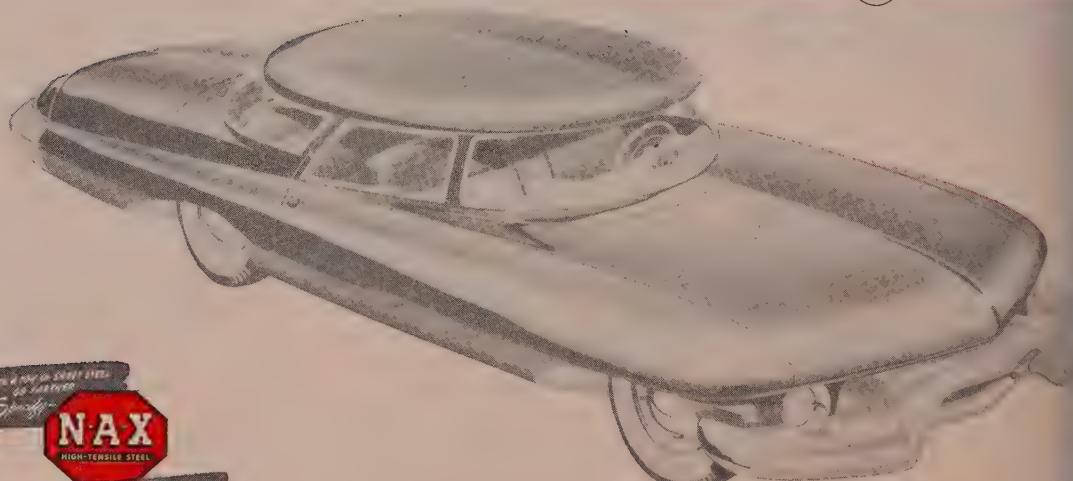
N-A-X Alloy Division

Ecorse, Detroit 29, Mich.

NATIONAL STEEL CORPORATION



NATIONAL STEEL



KEEP YOUR SCRAP MOVING TO YOUR DEALER

Worker carelessness is increasing automakers' headaches. While most cars are o.k. on quality, the occasional lemon is squeezing in

ONCE UPON A TIME, an irate customer concluded that the new car he had purchased was a lemon. He proceeded to decorate the offending vehicle with signs and stencils which made his opinion known.

Even a court, so the story goes, decided in and reduced his claim to a whisper by ruling that you cannot label your car a lemon though it is your car and it is a lemon. In the eyes of the law, it appears, there is no lemon-aid.

Worried—That story may be fanciful, but the fact remains that automakers are worried about their products' quality. Despite all their painstaking testing and ingenious engineering, an occasional lemon is being squeezed today into the factory garage. Tales like the following show why:

One of several automakers produces two models with the same basic body. The difference is slight about by the use of distinctively different trim on the two. Not long ago a vehicle went off the line and emerged to start a minor controversy. Approached from the right side the car was a V-8 Dilocks Deluxe, while from the left it was a crewcut standard.

More serious was an occurrence in an engine assembly line. Pistons from this assembly line are matched in the block, then numbered and put on an overhead conveyor to receive valves before meeting the block again further down the line for final assembly. On this black day a worker missed one set of pistons completely and the next thirty engines coming down the line had the valves of the block ahead.

The error was caught, of course, thirty engines had to be pulled off the line and run through again. The cost to the auto companies of sort of error runs into millions of dollars annually, not to men-

tion the good will lost when an owner gets a car with one of the grosser errors which has somehow escaped detection.

Despite Precautions—It's somehow a little sickening when engineering departments will take a little gadget like a door latch and put it on a test stand where it is relentlessly slammed and opened thousands of times. When the design and materials have proven themselves to the engineer's satisfaction, the latch is produced for the cars. Then some worker on the line forgets to tighten a screw or pinch a clamp and the door flies open. Maybe nobody is injured, but to the owner and his friends the Bloopoer V-8 has unsafe door latches.

The problem is not new to the automakers. Obvious answers have been evolved in such techniques as automation, automatic or multiple gaging, breaking the assembly down into extremely simple repetitive tasks, etc. But in the last analysis, the worker still has a role to play in building your pride and joy. It is that role which leads to knobs coming off in your hand, turn signals that don't cancel, rattles under the dashboard, windows that leak and a thousand more serious maladies that creep in to make an occasional auto owner wonder if his car was ever engineered at all.

Labor Shortage—Today the labor shortage in Detroit is acute. Automakers estimate they could use another 20,000 persons right now and increasingly older, handicapped and women employees are being drawn in. Wage rates in Detroit are no longer high enough relative to rates elsewhere to tempt workers to the motor city.

A natural result of that sort of situation is a tendency to set up jobs so that the worker who previously tightened five bolts on the



Light on Crankshaft Strain

Tiny spinning mirrors, actually 240 chrome-plated gear teeth on a special fan belt pulley, help Ford Motor Co.'s engineers produce tougher crankshafts. Crankshaft twist sets up a vibration pattern which can be measured from the reflected light beams

assembly now tightens six. He or she has a 20 per cent greater chance of lousing up the dinkus assembly in your new whatsis. With the influx of newer workers, more inspectors are needed on the line and the amount of line repair is stepped up. Here again, occasionally something can go wrong.

Attitude—But the most telling result of the labor shortage is worker indifference in many cases. If the automaker should be fortunate enough actually to fire a worker without losing a week's production in wildcat strikes as a result, the worker knows that he can go right across the street and get another job. And as you may have discovered in your own plant, that leads many to indifference that will show up in the final product despite all that can be done.

In most cases the dealer stands behind the car he sells. If things are wrong with your new car list them for correction before the guarantee period runs out. And

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,557
March	746,933	525,024
April	570,464	
May	542,559	
June	542,478	
July	226,134	
August	322,755	
September	595,715	
October	656,767	
November	548,782	
December	569,715	
Total	5,989,509	
Week Ended	1953	1952
Mar. 7	158,825	115,126
Mar. 14	165,762	120,392
Mar. 21	169,923	125,347
Mar. 28	181,749	132,850
Apr. 4	181,855	125,668
Apr. 11	179,000*	123,180

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary

remember as your windshield wiper sails by in the slipstream that such occurrences are signs of the times.

The automakers are having their troubles, too.

Car of the Week

Commenting on the new Dodge V-8, one newsman was moved to ask, "Who put the Benzedrine in Grandma Dodge's Ovaltine?" A week spent driving a Dodge Coronet makes it quite clear the stuff is there.

In the minds of many, Dodge has been the car of the school teacher and the minister — dependable, middle-classish and not spectacular in performance. Now comes the Red Ram engine with a thrust that would toss any school marm's textbook into the back seat and give many on the road their first look at the rear end of a Dodge. One may well ask what has happened.

The answer in brief is that Dodge is hoping to expand its market. Dependability and unpretentious comfort still keynote the Dodge, but the Red Ram is aiming for the young bucks.

Production of these 140-hp vitamin pills for the Dodge emblem has now reached 1200 daily after a unique beginning (see STEEL, Nov. 24, 1952, p.83, for details) and the ultimate capacity will be 2400 per

day when additional machine tools are delivered later this year.

The new Dodge, to put it bluntly, is not much like a Dodge. Getaway is noteworthy and available torque on the road for passing leads to confidence. At cruising speeds of 60-70 the car is steady and steering control is sufficiently sensitive. Cornering appears to be better than average and the over-all feeling of reserve power and control is very satisfying.

The tinted glass available at additional cost contributes to greatly reduced eye fatigue during a 175-mile trip at night, incidentally, and appears to be a worthwhile addition.

Dodge has termed its new line the "action" car. Now it is waiting to see if school teachers like "action" and whether those traditionally action-minded will accept the car. One thing seems sure—the "action" car has not been misnamed.

We Prefer Deluxe, Says Pontiac

Pontiac reports that Americans prefer deluxe motor cars. Sales of the luxurious hardtop Catalina coupe have risen from 8 per cent of the division's sales in 1950 when the model was introduced to 19.1 per cent in 1952. A further increase in production of the model is expected. Further evidence of the public's taste is revealed in the fact that in December, the introductory month for Pontiac, 12 deluxe models were built for every special model. By February the ratio was 15-1 and projected schedules for the next few months will hold to the higher figure, says H. E. Crawford, general sales manager.

Mercury Offers Power Braking

Mercury models now have a power braking system as optional equipment. Direct mechanical linkage with the master cylinder has been preserved and a vacuum reservoir supplements the engine intake manifold as the source of vacuum braking power. A 33 per cent reduction in brake pedal pressure is claimed while the pedal is placed almost level with the accelerator making for quicker



Mark This Jaguar

Jaguar cars Ltd., which recently F Borg-Warner automatic transmission in its Mark VII sedan (above), will soon produce a convertible to capture more dollars in the American market. Jaguar, England's biggest dollar earner, has doubled U.S. sales each year since 1948 when the line was first introduced here. The convertible will use the Jaguar XK-120 chassis.

movement from one to the other. Also new at L-M is a zipper being used on convertibles that automatically seals itself against air and water. Previously developed and used only on military equipment, this omniscient gimmick is being used to seal out moisture around detachable plastic rear windows on 1953 Lincoln and Mercury convertibles. A pair of rubber lips fold over metal teeth to seal the fastener and "to prevent unsightly wicking of moisture through the fabric to the outside." Overlapping flaps around windows are needed to protect conventional zippers are eliminated.

Ternstedt Gets Buick Plant

The Buick Coldwater Road plant now under construction has been assigned to the Ternstedt Division. Originally planned as a subassembly plant for jet engine parts, the plant now will be used for automotive hardware and defense products.

Chevrolet To Build Labs

Chevrolet Division of G.M. will build a new engineering center including an administration building, experimental shop and laboratory at the General Motors Technical Center near Detroit. Cost is estimated at \$20 million, of which new equipment will account for about one-half.

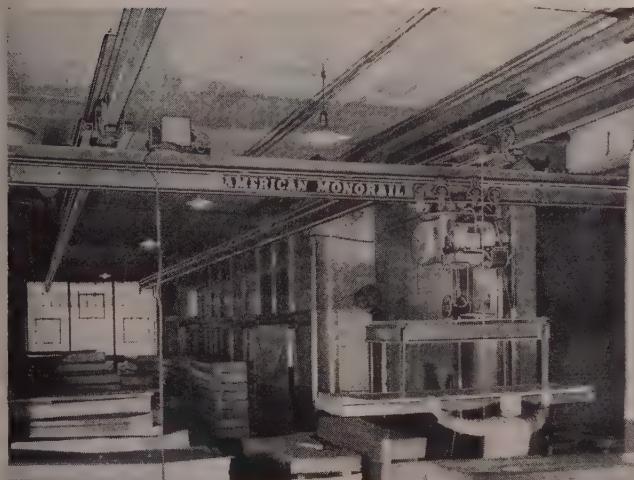
AMERICAN MONORAIL

- INCREASES PLANT CAPACITY AND PRODUCTION
- REDUCES HANDLING COSTS, DAMAGE AND LOSS

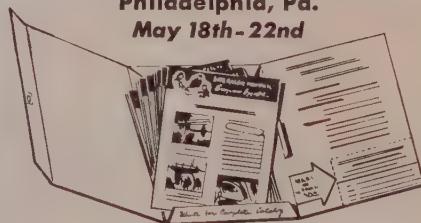
American MonoRail Engineers can show you how to get more profitable production out of your plant by systematizing material handling. Let them show you how to convert lost ceiling space to profit—how to eliminate obstructive storage around ma-

chines—lessen worker fatigue—reduce heavy load accidents—stop damage to product in motion.

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**5th National
Materials Handling Exposition**
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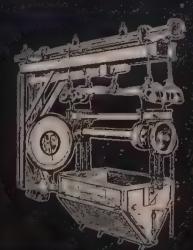
RUGGED SWITCH CONSTRUCTION



OVERLAPPING SPLICE



TWO PIECE FORGED YOKES

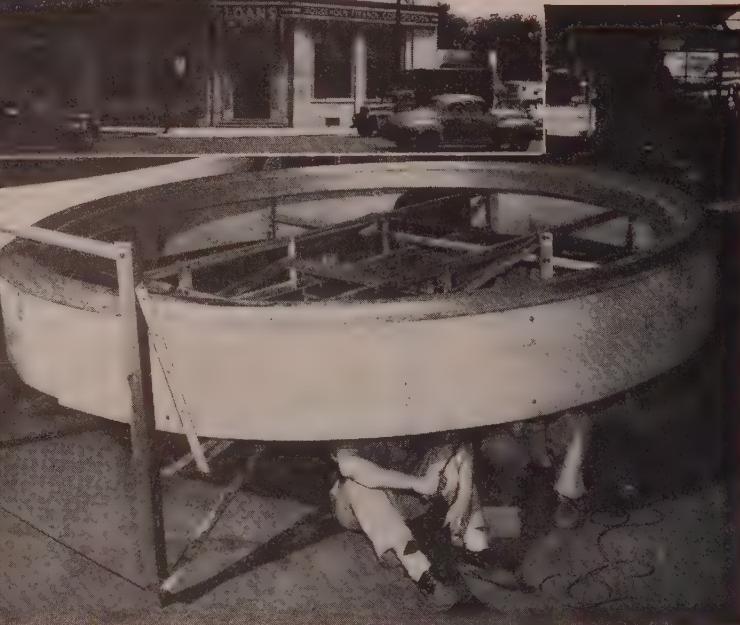
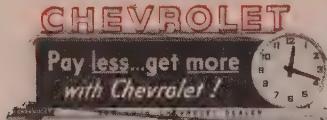


SCALE HOIST CARRIER



FREE MOVING CRANES

SHARON Galvanite



Leading Sign Builder Chooses Galvanite

Builders of signs for outside display consider atmospheric conditions their greatest single enemy. The snow, sleet and wind conditions in the north and east, the tremendous heat in the south and southwest, the salt air of the oceanic areas and the destructive fumes of industrial concentration all must be considered when designing and building a display for national consumption.

That's why a great many sign builders have turned to Galvanite*

— the weather-fighting, zinc coated steel developed by Sharon to add life to steel where it is subjected to the constant ravages of the atmosphere. Galvanite* is used to a great extent in the automotive, appliance and building industries because it is easy to use, it holds its coating under severe forming conditions and provides an excellent surface for enameling, painting or further finishing.

If you are looking for a good, serviceable, weather-resistant steel

be sure you have all the facts. Write the Sharon office nearest you, write direct for fully explanatory Galvanite* booklet.

*TM

DISTRICT SALES OFFICES

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Cleveland	Dayton
Detroit	Indianapolis
Milwaukee	New York
Philadelphia	Rochester
Los Angeles	San Francisco
Montreal, Que.	Toronto, Ont.

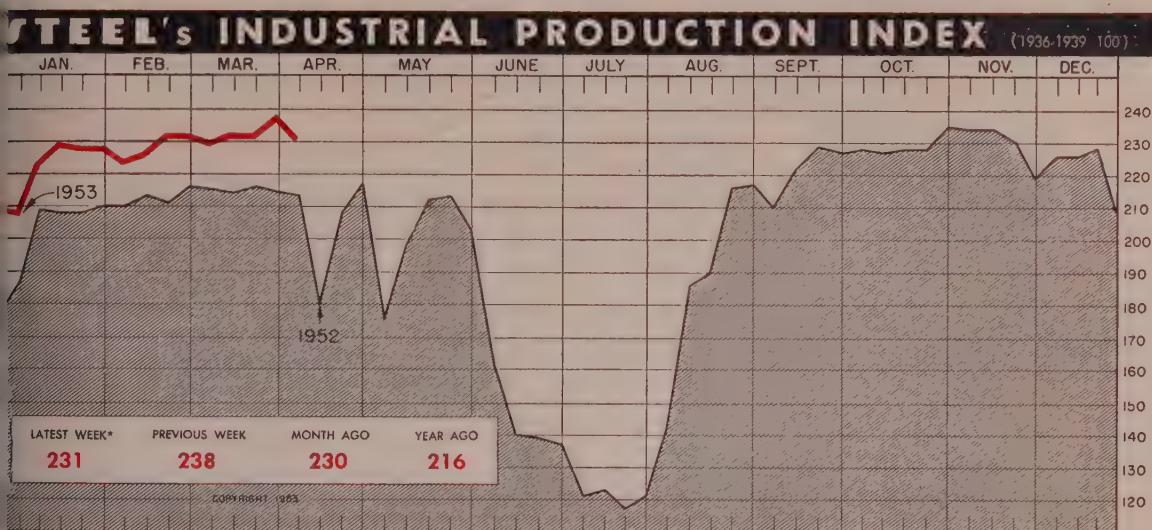
Where Rust Is A Problem-First Consider



SHARON STEEL CORPORATION

Sharon, Pennsylvania

The Business Trend



ended Apr. 4

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

Businessmen are preparing for an era of stiff competition by spending heavily on new distribution facilities. Production index declines as steel output falls off

OFFS of future business conditions are often found in the momentum of new construction. Dolar-spent on private and public facilities are good indicators of what is expected business-wise by industry, government and the public. Outlays on new construction in the first quarter set a new record for the season by climbing to \$7 billion, or 6 per cent over expenditures in the same months in 1952, indicates the Commerce Department's Building Materials Division.

Lags — Diverse trends, however, are showing a tendency to shape up among the different construction categories. Expenditures on public construction in the three months of 1953 rose only 1 per cent over the year to \$2 billion, despite increases in military, public utility expenditures. Private expenditures, on the other hand, jumped 7 per cent over a year earlier to over \$4.9 billion. Considering the 2 to 3 per cent rise in the cost of construction, new facilities probably declined in number of units while the per-unit-total gained substantially more than 7 per cent.

The direction of business outlays is increasingly toward the

distribution level, rather than production. Private industrial outlays for new construction in the first quarter dropped 5 per cent over the year to \$588 million. Meanwhile, expenditures jumped 39 per cent to \$150 million on warehouses, office and loft buildings. Construction spending rose 49 per cent to \$185 million on stores, restaurants and garages.

These figures indicate that businessmen are becoming increasingly conscious of John Q. Public. Stores and service establishments are moving to newly developed areas and more warehouse space is being added to house the many consumer goods coming off assembly lines. The tip-off in new construction may well be that competition and selling will have star-billing in the coming industrial drama.

Temporary Drop — After setting a new postwar record in the previous week, industrial activity took a temporary decline in the week ended Apr. 4. STEEL's production index for the week fell 7 points to 231 of the 1936-1939 average. Most of the decline was caused by the turn-off of many steel operations in Pittsburgh, which, in turn, lowered freight car loadings. Automotive

operations inched up slightly, as did electricity production.

Steel Production Drops . . .

Steel production is making a quick return to high levels after a setback in the Pittsburgh area from the shutdown of an open-hearth shop at U. S. Steel Corp.'s Homestead Works for repairs and a strike on a railroad serving U. S. Steel plants. National output of steel in the week ended Apr. 4 dropped 134,000 net tons to 2,190,000 tons, according to the American Iron & Steel Institute. In the week ended Apr. 11, production regained an estimated 26,000 tons as furnaces started producing again when the strike ended. The open-hearth shop remains closed.

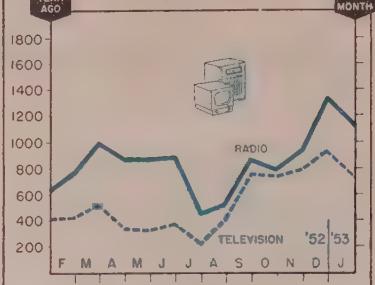
Truck Output Nears Record . . .

The truck industry, spurred by insistent demand, may raise its monthly output in April to within 2 per cent of the all-time high. Both light and heavy trucks are rumbling off U. S. production lines at a near-record momentum as steel becomes more available. If assemblies continue without a hitch, completions this month may total around 137,000 trucks, about 3000 vehicles under the monthly peak established in May, 1951, says Ward's Automotive Reports.

Production in the first quarter of

RADIO AND TELEVISION OUTPUT

IN THOUSANDS OF UNITS



Radio and Television Output

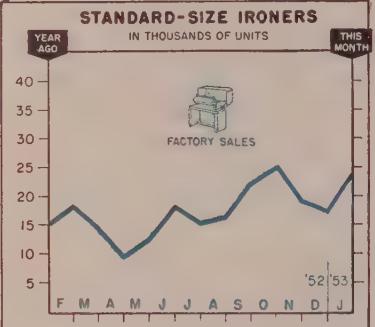
Thousands of Units

	Radio	Television	Radio	Television
	1953	1952	1953	1952
Jan.	1,093	632	719	405
Feb.	1,192	759	730	409
Mar.	...	976	...	511
Apr.	...	843	...	323
May	...	748	...	309
June	...	874	...	361
July	...	442	...	199
Aug.	...	544	...	398
Sept.	...	866	...	756
Oct.	...	772	...	724
Nov.	...	924	...	780
Dec.	...	1,325	...	921
Total	...	9,711	...	6,096

Radio-Television Mfrs. Assn.

STANDARD-SIZE IRONERS

IN THOUSANDS OF UNITS



Standard Size Ironers

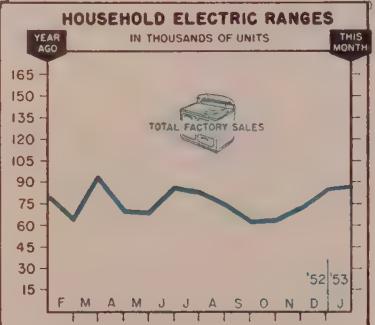
Factory Sales—Units

	1953	1952	1951
Jan.	24,395	15,636	24,600
Feb.	22,586	17,620	32,400
Mar.	...	13,913	34,700
Apr.	...	8,938	23,700
May	...	12,652	24,200
June	...	17,654	24,500
July	...	15,025	11,100
Aug.	...	16,477	17,200
Sept.	...	22,492	18,300
Oct.	...	25,204	29,800
Nov.	...	19,724	20,500
Dec.	...	16,798	16,900
Total	...	202,143	277,700

American Home Laundry Mfrs. Assn.

HOUSEHOLD ELECTRIC RANGES

IN THOUSANDS OF UNITS



Household Electric Ranges

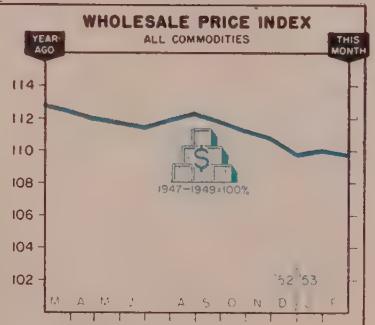
Total Factory Sales—Units

	1953	1952	1951
Jan.	88,145	79,982	130,316
Feb.	...	63,063	121,585
Mar.	...	93,225	159,865
Apr.	...	69,149	118,823
May	...	68,117	106,685
June	...	86,847	106,588
July	...	83,465	60,530
Aug.	...	74,853	64,042
Sept.	...	62,404	93,551
Oct.	...	63,143	109,043
Nov.	...	72,982	101,476
Dec.	...	84,630	72,140
Total	...	901,860	1,244,645

National Electrical Mfrs. Assn.

WHOLESALE PRICE INDEX

ALL COMMODITIES



Wholesale Price Index

(1947-1949=100)

	1953	1952	1951
Jan.	109.9	113.0	115.0
Feb.	109.6	112.6	116.5
Mar.	...	112.3	116.5
Apr.	...	111.8	116.3
May	...	111.6	115.9
June	...	111.3	115.1
July	...	111.8	114.2
Aug.	...	112.2	113.7
Sept.	...	111.7	113.4
Oct.	...	111.1	113.7
Nov.	...	110.7	113.6
Dec.	...	109.6	113.5

U. S. Bureau of Labor Statistics

Charts Copyright 1953 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Apr. 6	Gear Sales	Mar. 9	Refrigerators	Feb. 2
Durable Goods	Mar. 30	Gray Iron Castings	Mar. 16	Steel Castings	Mar. 16
Employ. Metalwk.	Mar. 30	Indus. Production	Feb. 16	Steel Forgings	Mar. 16
Employ. Steel	Apr. 6	Machining Tools	Mar. 23	Steel Shipments	Nov. 3
Fab. Stire. Steel	Mar. 30	Malleable Castings	Mar. 16	Vacuum Cleaners	Mar. 23
Foundry Equip.	Mar. 23	Pumps	Apr. 6	Wages, Metalwk.	Mar. 9
Freight Cars	Mar. 23	Prices, Consumer	Jan. 26	Washers	Mar. 30
Furnaces, Indus.	Apr. 6	Ranges, Gas	Mar. 30	Water Heaters	Mar. 30

1953 ran to 342,624 light and heavy vehicles, the third highest output quarter in history and 8 per cent over the January-March turnout of 1952. Industry shipments in the first quarter continued to lean toward the light models; lights garnered 67.1 per cent of the total compared with 62.1 per cent in the first quarter of both 1952 and 1953.

Passenger cars are also coming off assembly lines at a rapid pace. U. S. assemblies in the week ended Apr. 4 totaled a robust 140,134 cars, more than 50 per cent over production in the comparable week of 1952. This is slightly above the previous week's 139,276 units and marks the strongest output since March, 1951.

Combined U. S. and Canadian production in the week ended Apr. 4 totaled 181,855 passenger cars and trucks, up only 106 units from the previous week but well over the 125,668 units produced in the week ended May 5, 1952.

Consumer Credit Soaring...

A big question arising in the metalworking picture: "Can the public afford to spend much more on new durables?" Fact is, installment credit in the past year has risen at an alarming rate. Several important leading organizations are tightening terms, and many economists see a continuing trend toward a tight money market. The Federal Reserve Board says that installment credit in the year ended Mar. 1 rose 26 per cent to \$16.7 billion. Installment sales credit rose 30 per cent to \$10.5 billion, and automotive sale credit alone jumped 38 per cent to \$2.5 billion.

New Firms Increase...

More new companies opened their doors for the first time in January and February than in any two like two months in the last four years. New incorporations received charters in the first two months of 1953 totaled 17,454 firms, up 12.4 per cent from last year and more than in any comparable period since 1948, says Dun & Bradstreet Inc. New incorporations in February numbered 7,947 enterprises, an increase of 11.3 per cent over a year earlier, while charters in January went

BAROMETERS OF BUSINESS

INDUSTRY	LATEST PERIOD	PRIOR WEEK	YEAR AGO
Steel Ingot Output (per cent of capacity) ²	95.0	101.0	103.0
Electric Power Distributed (million kwhr)	8,080 ¹	8,075	7,219
Bituminous Coal Output (daily av.—1000 tons)	1,366	1,353	1,638
Petroleum Production (daily av.—1000 bbl)	6,475 ¹	6,482	6,402
Construction Volume (ENR—millions)	\$342.0	\$344.1	\$345.7
Automobile, Truck Output (Ward's—units)	181,855	181,749	125,668

TRADE	LATEST PERIOD	PRIOR WEEK	YEAR AGO
Freight Car Loadings (unit—1000 cars)	705 ¹	715	706
Business Failures (Dun & Bradstreet, number)	171	188	185
Currency in Circulation (millions) ³	\$29,754	\$29,600	\$28,445
Dept. Store Sales (changes from year ago) ³	+11%	+16%	+7%

FINANCE	LATEST PERIOD	PRIOR WEEK	YEAR AGO
Bank Clearings (Dun & Bradstreet, millions)	\$18,188	\$18,575	\$17,542
Federal Gross Debt (billions)	\$264.5	\$264.7	\$257.5
Bond Volume, NYSE (millions)	\$14.3	\$16.2	\$13.6
Stocks Sales, NYSE (thousands of shares)	9,826	9,677	7,553
Loans and Investments (billions) ⁴	\$77.8	\$78.0	\$73.7
United States Gov't. Obligations Held (billions) ⁴	\$30.6	\$31.0	\$32.0

PRICES	LATEST PERIOD	PRIOR WEEK	YEAR AGO
TEEL's Weighted Finished Steel Price Index ⁵	181.31	181.31	171.92
TEEL's Nonferrous Metal Price Index ⁶	230.5	225.1	243.6
Al Commodities ⁷	109.8	110.0	112.5
Metals and Metal Products ⁷	113.3	113.4	114.2

Dates on request. ¹Preliminary. ²Weekly capacities, net tons: 1953, 2,254,458; 1952, 2,077,040. ³Federal Reserve Board. ⁴Member banks, Federal Reserve System. ⁵1935-1939=100. ⁶1936-1939=100. ⁷Bureau of Labor Statistics Index, 1947-1949=100.

3 companies, or 13 per cent more than in January, 1952.

Railroad Incomes Rise . . .

Railroads are finding that low-operating expenses this year more than offsetting their in revenue. The Association of American Railroads estimates the net income of Class 1 roads in January and February 20 per cent over a year earlier \$114 million. Total operating revenues in the first two months 1952 amounted to \$1.7 billion, increase of 2.1 per cent, while expenses amounted to \$1.3 billion, or per cent under the same two months, last year.

Gasoline Orders Climb . . .

Builders of industrial furnaces gained in February slightly more new orders than in January, considerably more than in February of last year. New orders (February for fuel-fired furnaces other than for hot-rolled steel) led \$3.9 million in value, compared with \$3.5 million in January \$2.4 million in orders placed February, 1952. Orders for electric-resistance furnaces totaled in February \$1.7 million, only \$27, over January but well over the \$1 million valuation of orders placed in the same 1952 month.

Radio, TV Output Up . . .

Rising production of television receivers is continuing to brighten the electronics picture. Radio-Television Manufacturers Association says that U. S. plants in February produced 730,597 TV sets, compared with 409,337 units in the same month of 1952. Radio production also moved at a fast pace in February, with assemblies totaling 1,192,439 units. In February, 1952, industry output amounted to only 759,453 radio receivers.

Trends Fore and Aft . . .

Manufacturers of durable goods in February chalked up a \$12.2 billion sales volume, or 14 per cent above February, 1952. Inventories rose 5 per cent in the year ended Mar. 1 to \$24.5 billion . . . Wholesalers' sales in February rose 2 per cent over the same month in 1952. . . Electricity production in the week ended Mar. 28 rose 11.1 per cent over the comparable week, a year earlier. . . The profit picture for March is better than at any time in the past six months, reports a survey of the Purchasing Agents Association of Chicago. . . General Electric is cutting \$13 to \$15 off the price of its electric blankets.

"We use Thinsteel,
it saves us
plenty of money!"



"We're former Sheet Coil users. After testing Thinsteel, the precision cold rolled strip steel, it was evident that many dollars could be saved. First, we get more finished parts per ton because of Thinsteel's exceptionally close tolerance — providing maximum feet per pound. Next, we are getting much longer die life—that means less 'downtime,' too—because Thinsteel's uniformity of physicals and accuracy to all specifications smoothed our fabricating problem. And the finish keeps us out of 'hot water' in our plating department—gives us the best looking job in our business and that means more profitable business for us. Maybe you had better switch to Thinsteel."

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No need for argument as to which strip is better for your job. Kenilworth stocks both—and is ready to help you determine your best buy. Make Kenilworth's big inventory your warehouse—you can depend on Kenilworth's service when you need it.

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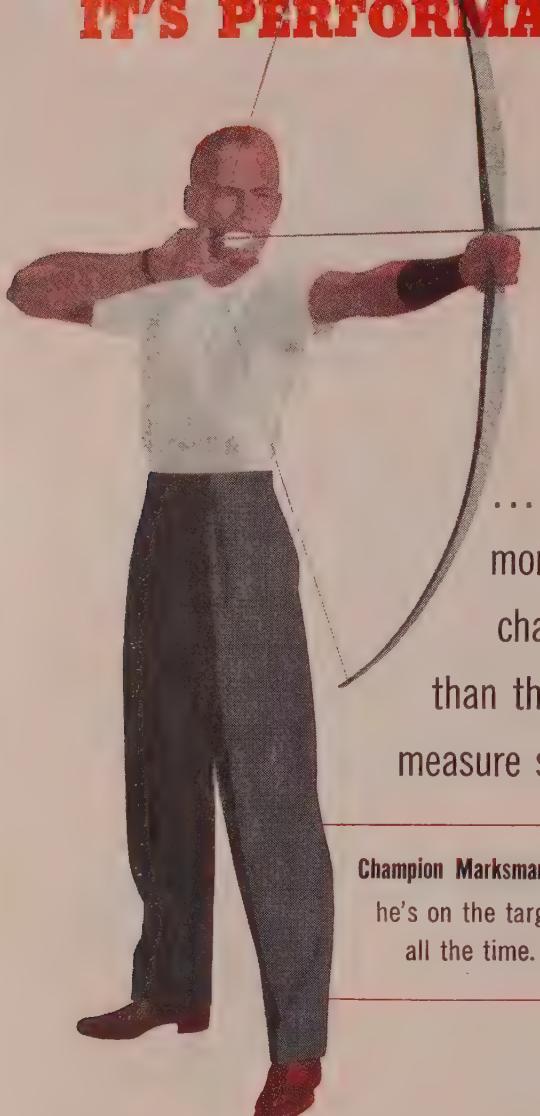
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the same, but he may
not be on the target
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Men of Industry



G. M. STICKELL
... Landis Machine gen. mgr.



PAUL W. KNOX
... a purchasing agent at Eaton Mfg.



W. H. ROWAND
... a v. p. at Babcock & Wilcox

M. Stickell, vice president, **Landis Machine Co.**, Waynesboro, Pa., assumes added duties of general manager. **J. H. Elliott**, who formerly served as president and general manager, will continue as presi-

Ert T. Both, general superintendent of Cleveland operations for **Brass & Copper Co. Inc.**, subsidiary, Kennecott Copper Corp., appointed works manager at Cleveland. **Charles W. Yarrington** made general superintendent, Cleveland mills.

Illin Steel Co., St. Louis, elected **E. Nolan** vice president and **W. L. Stant** to the president, and appointed **Milton O. Kassing** purchasing agent.

Miley T. Johnson was made purchasing agent, nonferrous metals, **United States Steel Corp.**, Pittsburgh, succeeding the late **Anthony Igusa**.

Davidson, recently named director of sales and service, **Clinton Chain Co.**'s engine division, Mankato, Iowa, has received another promotion as general manager, Clinton Chain Saw Division, Clinton, Mich. **Clete Erlacher**, sales manager, Clinton Engine Division, now heads the entire sales service there.

Paul W. Knox was added to the central purchasing staff at **Eaton Mfg. Co.**'s general offices in Cleveland, responsible for procurement of the company's steel requirements. Mr. Knox has served U. S. Steel Corp. in various capacities for 17 years, most recently as Cleveland district service manager.

F. B. Pinzel was appointed assistant general sales manager, **Buffalo Steel Division**, H. K. Porter Co. Inc. He has been engaged in sales with Republic Steel Corp. for more than eight years.

Donald E. Hawkinson, for 26 years with **Greenlee Bros. & Co.**, Rockford, Ill., was appointed sales manager of its special machine tool department. **E. C. Van Tiem** was made manager, Detroit office, to succeed the late **John M. Macrae**.

Eugene A. Pelizzoni was made works manager, **Atkins Saw Division**, Indianapolis, Borg-Warner Corp. He formerly was assistant works manager, Mack Mfg. Corp.

Mid-States Welder Mfg. Co., Chicago, elected **William W. Jetter** president and **J. William Jetter** vice president and general sales manager.

J. C. Scott is new product sales manager of **Fruehauf Trailer Co.**, Detroit.

At Babcock & Wilcox Co., New York, **W. H. Rowand**, boiler division, was elected a vice president, continuing as divisional chief engineer. **M. Nielsen**, recently elected a vice president, was placed in charge of that division's manufacturing department. In the refractories division, **J. E. Brinckerhoff** was named general manager, **C. L. Norton Jr.** executive assistant in charge of development and engineering, **Carl Claus** executive assistant in charge of sales and manufacturing. **J. D. McCullough** continues as chief engineer with additional duties, and **Mark J. Terman** becomes sales manager. **C. H. Gay**, vice president and former head, manufacturing department, boiler division, was placed in charge of the newly established atomic power division.

A. M. Byers Co., Pittsburgh, appointed **Buckley M. Byers** general manager, wrought iron sales. He succeeds the late **R. H. Gardner**.

John J. Egan Jr. was appointed manager of sales, partitions and conveyor divisions, **Virginia Metal Products Corp.** His headquarters will be in Orange, Va.

Iland Steel Co., Chicago, appointed **Samuel G. Wagner** assistant to the manager, sheet and strip division, sales department. **Richard D.**

Browne succeeds as assistant manager, order division.

A. W. Jacobson was made manufacturing manager, pilotless aircraft at **Boeing Airplane Co.**, Seattle. **W. E. Ramsden** fills the position of experimental department manager.

Max Noble rejoins **Cory Corp.**, Chicago, in an executive sales promotion capacity. He has been with National Production Authority.

General Fireproofing Co., Youngstown, elected **E. A. Purnell** first vice president, **Alfred J. Ball** vice president-furniture sales, and **D. W. McClure** vice president-contract sales.

Copper Range Co., Boston, elected **J. V. O'Connor Jr.** a vice president. He has been located in Pittsburgh, associated with the **C. G. Hussey & Co.** division since 1935.

Ekco Products Co. appointed **Norman J. Gaynor Jr.** manager of its Canton, O., plant. He formerly was general superintendent of **Lalance & Grosjean**, Woodhaven, L. I.

A. O. Smith Corp., Milwaukee, appointed **George M. Graetz** manager of its new eastern plant, welding products division, now under construction at Lancaster, Pa., and scheduled for completion by early summer. Mr. Graetz was project manager in the development of the new plant for welding electrodes. This past year he assisted **J. J. Bohmrich**, group executive.



JOHN D. WRIGHT
... new president of *Thompson Products*



FREDERICK C. CRAWFORD
... chairman, *Thompson Products*

At **Thompson Products Inc.**, Cleveland, John D. Wright becomes president succeeding **Frederick C. Crawford**, who moves up to chairman of the board. Mr. Wright was vice president and general manager, and continues in the latter position.

Gilmore Roberts succeeds **Edwin J. Donewirth**, retired, as manager, stamping plant, **American Radiator & Standard Sanitary Corp.**, Buffalo.

T. H. Herbst was appointed factory manager, **United Tube Corp.** of Ohio, Cleveland. Before joining United Tube he was associated with **Linde Air Products Co.** for 17

years, most recently in charge inert gas welding development.

Arthur M. Simpson was made manager, revolving door division, **International Steel Co.**, Evansville, Ind. **Ray Goad** will be sales manager. Mr. Simpson formerly was vice president of **Kawneer Co.**

Philip D. Pearson was appointed manager, **Caland Ore Co.**, Inland Steel Co.'s Canadian subsidiary. **E. W. Whitman** was named chief engineer at Caland's Steep Rock, Ont., operations.

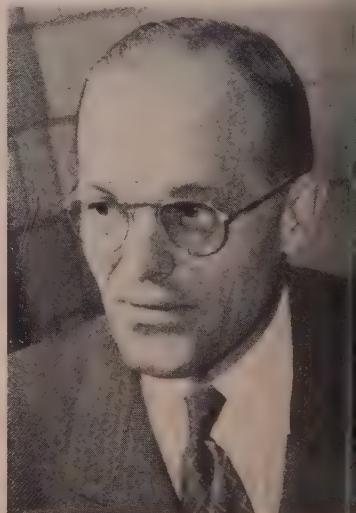
Tom R. Smith, director of research and development for **Maytag Co.**, Newton, Iowa, since 1938, w-



GEORGE M. GRAETZ
... plant mgr. for *A. O. Smith Corp.*



T. H. HERBST
... United Tube factory mgr.



TOM R. SMITH
... *Maytag* v. p.-research, developer



"A Triple play BY RB&W

REALLY SAVED US PLENTY!"

"It took us by surprise," Al went on, "when an RB&W man told us* he could speed up assembly of this precision screw-and-clamp unit and save us money besides. We figured we'd been doing O.K. the old way."

"What was the old way?" asked Mac, who'd recently started in at the shop.

"Well, it was a one-two-three operation. We used to machine the slotted-head screw for the clamp on that machine over there. Then we'd make a special collar, and fit it around the screw head to prevent the screw-driver from slipping out of the slot while the clamp was being applied or adjusted.

"What RB&W did was to cold-form the whole thing—screw, slot and collar—all in one piece. Wasn't an easy job, either—they had to strike a slot in the screw head and form the collar at the same time. Now we're saving one-third on our previous assembly costs—along with the price of the special collar."

Which proves that you can gener-

ally cut costs, if you look hard enough... even in such simple things as fasteners. It also underlines the creative approach to fastening problems you can expect from RB&W, as well as practical experience in designing and fabricating. If the fastener you need can't be supplied from our extensive stock, we'll study your assembly operation and make the right one for the job.

Remember—for any fastening operation, it's a smart move to call in RB&W. You can count on RB&W bolts, nuts, screws and rivets for uniform accuracy, dependability and physical properties. And you can also count on fast service from RB&W's strategically located plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Pittsburgh, Detroit, Chicago, Dallas, San Francisco. Sales agents at: Portland, Seattle. Distributors from coast to coast.

**RUSSELL, BURDSALL & WARD
BOLT AND NUT COMPANY**

2.12

*George K. Garrett Co.,
Philadelphia, Pa.

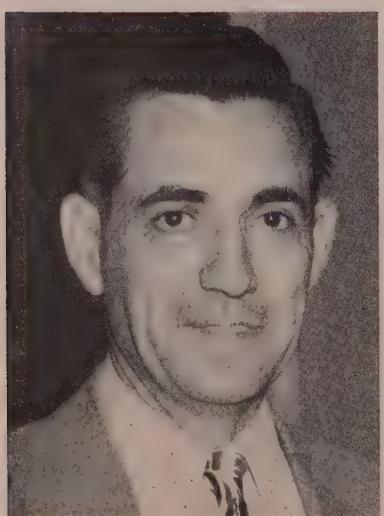
RB & W 108 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG



EADS JOHNSON JR.
... new president, Southern Wheel Div.



EDWIN H. WALKER
... McKinnon Industries president



RAY BISHOP
... works mgr., J. I. Case Co.

named vice president-research and development, a newly created office.

Eads Johnson Jr., formerly executive vice president, was promoted to president, Southern Wheel Division, American Brake Shoe Co., New York. He succeeds **William F. Cutler**, retired.

William Beeson was elected manager of sales, Philadelphia territory, Jessop Steel Co. He succeeds **H. E. Doughty**, retired.

Cooper-Bessemer Corp. appointed **Tom McMichan**, works manager, and **Frank Stevenson**, assistant works manager, as special assistants to the president. They are stationed at the headquarter plant in Mt. Vernon, O. **Willard Luli**, former production manager, was named works manager at Grove City, Pa., plant.

Edwin H. Walker was elected president and general manager, **McKinnon Industries Ltd.**, subsidiary of General Motors Corp., St. Catharines, Ont. He succeeds **Thomas J. Cook**, retired. Mr. Walker has been assistant to Mr. Cook.

Harold Wolf was elected vice president-sales and **Stanley Steele** treasurer, Roth Steel Warehouse Co., Chicago.

Frank P. Agenten was appointed chief engineer, Precision Machine Co., Milwaukee. Until recently he was assistant to the president at Milwaukee Equipment Mfg. Co.

Ray Bishop was promoted from superintendent to manager of the Rock Island, Ill., Works of **J. I. Case Co.**

Harold T. Clark was named assistant director of research to supervise all divisions of research at **Jones & Laughlin Steel Corp.**, Pittsburgh. **George H. Enzian** was promoted to manager, metallurgical research.

Crucible Steel Co. of America, Pittsburgh, appointed **Richard L. Roberson** assistant manager, Indianapolis branch, and **M. G. Brown** to a similar position at Los Angeles.

Maremont Automotive Products Inc., Chicago, elected **Arnold H. Maremont** president to succeed

Howard E. Wolfson, now chairman of the board. The new president formerly was executive vice president, treasurer. He also is a director. **Jerome M. Comar**, vice president-secretary, was named executive vice president. **Milton A. Wolfson** was named to the new position of senior vice president.

Duell Gabbert was made purchasing agent and traffic supervisor, Chicago district, **United States Steel Corp.**'s products division.

Newly created New York sales office of **Cleaver-Brooks Co.**, devoted principally to boiler sales, is located in the Daily News building and managed by **Frank L. Phillips**. A second office was created to handle the sale of evaporator equipment, centrifugal and axial flow compressors and other specialized products under supervision of **James G. Brooks**, vice president. It continues, for the present, to be located at 50 Church St.

Donald L. DeVries was made manager, precipitator department, metal products division, **Koppers Co. Inc.**, Baltimore.

R. L. Wells was appointed assistant manager of engineering and **P. G. DeHuff** manager of engine design, aviation gas turbine division, **Westinghouse Electric Corp.**, Philadelphia.

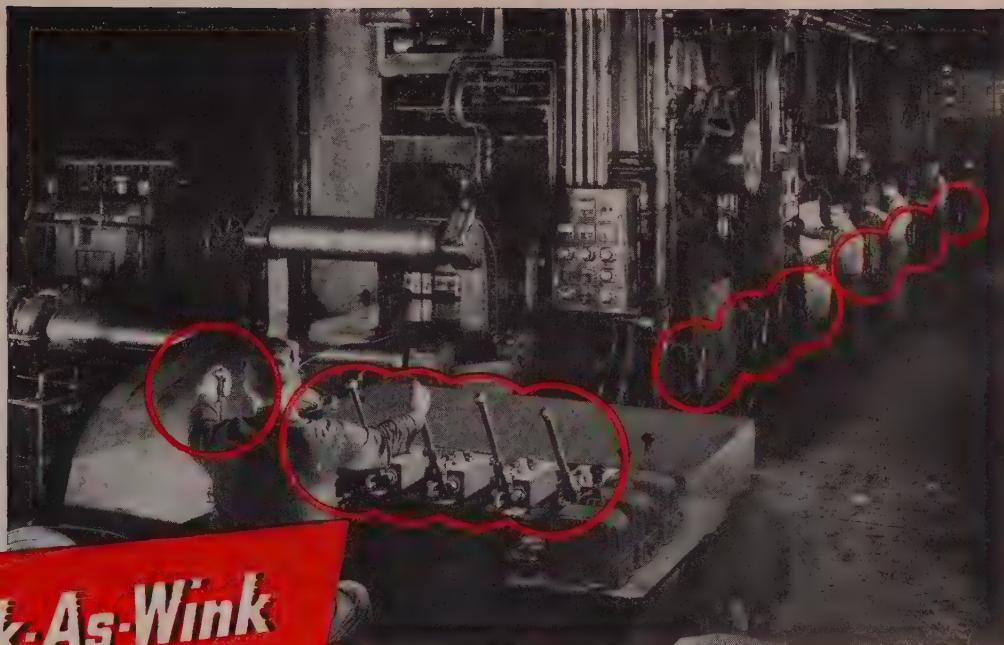
Farrel-Birmingham Co. Inc., Ansonia, Conn., appointed **Samuel Board Jr.** director of research at its Buffalo plant.

David A. Blevins was appointed production engineering supervisor, **Electric Regulator Corp.**, Norwalk, Conn. He formerly was chief engineer, **Shank Metal Products Co.**

Dr. Walter R. Hibbard Jr. was appointed manager of the new established alloy studies section, **General Electric Co.**'s metallurgical research department, Schenectady.

Food Machinery & Chemical Corp., San Jose, Calif., appointed **George R. Sommers** director of marketing for its machinery divisions. He formerly was with **Sylvania Electric Products Inc.**

Hy-Pro Tool Co., New Bedford, Mass., appointed **Harry B. Hubbard** direct factory representative.



Quick-As-Wink Control Valves

View of Quick-As-Wink Hydraulic Valve Installation in Steel Mill



Quick-As-Wink Completely Enclosed Diaphragm Operated Air Valves on Core Making Machine



Quick-As-Wink Solenoid Operated Air Valves on Battery of Heavy Duty Presses

**smooth month-after-month performance
minimizes your down-time**

- Gambling with breakdowns, lost production and plant tie-ups just doesn't pay. Play safe! Install Quick-As-Wink Valves on *all* your air and hydraulic controls. Positive and fast acting, all operating parts of Quick-As-Wink Valves are in pressure balance, eliminating any tendency to creep or crawl. Quick-As-Wink Valves can be serviced easily and quickly, during normal maintenance periods, usually without disturbing connecting piping. There is no metal to metal seating. All parts are standardized and readily interchangeable, avoiding the delay of returning valves to the factory for servicing, and the expense of maintaining large standby inventories. Standardize on Quick-As-Wink — and get *all* the advantages that *only* Quick-As-Wink Valves can give you.



Quick-As-Wink AIR AND HYDRAULIC Control Valves

Hand, Foot, Cam, Diaphragm and Solenoid Operated
Mfd. by C. B. HUNT & SON, INC., 1911 East Pershing St., Salem, Ohio

FOR SECURITY IN THE FIELD

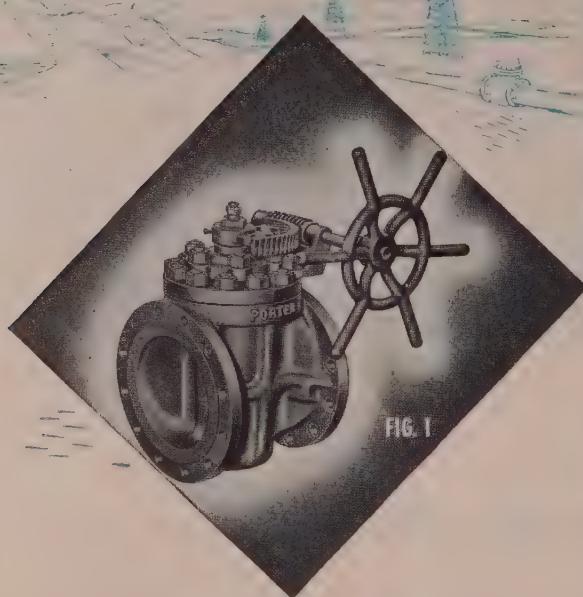


FIG. 1



FIG. 2

Porter Plug Valve Bodies are MEEHANITE CASTINGS

The Porter Valve Division of the H. K. Porter Company, Tulsa, Oklahoma, build a line of lubricated plug valves, Fig. 1, all of which are pressure castings subjected to a variety of combined and severe service stresses in the field. These stresses include high pressure, tensile and compressive forces, impact and distortion. The company, in describing their reason for the Meehanite specification states, "Porter finds Meehanite Metal provides an extra protection against cracking."

A not too infrequent problem in pipe line installation is the cracking of valve body flanges. This problem arises when the pipe line is not true. The combined high tensile strength, toughness and pressure tightness due to uniform density provided by Meehanite castings, Fig. 2, make them the logical solution to the problem involved. Porter Meehanite Valve Bodies are produced in sizes ranging from $\frac{1}{2}$ inch to 24 inches.

This application is another example of how "Meehanite Bridges the Gap Between Cast Iron and Steel"—combining the better properties of both.

MEEHANITE MEANS BETTER CASTINGS

MEEHANITE®
NEW ROCHELLE, N. Y.

Write for our new Bulletin #37 entitled—
"Proof That Meehanite Bridges the Gap".



MEEHANITE FOUNDRIES

American Brake Shoe Co.	Mahwah, New Jersey
The American Laundry Machinery Co.	Rochester, New York
Atlas Foundry Co.	Detroit, Michigan
Banner Iron Works	St. Louis, Missouri
Barnett Foundry & Machine Co.	Irvington, N. J. and Dover, New Jersey
E. W. Bliss Co.	Hastings, Michigan, and Toledo, Ohio
Builders Iron Foundry	Providence, Rhode Island
Compton Foundry	Compton, California
Continental Gia Co.	Birmingham, Alabama
Crawford & Doherty Foundry Co.	Portland, Oregon
The Cooper-Bessemer Corp.	Mt. Vernon, Ohio and Grove City, Pennsylvania
De Laval Steam Turbine Co.	Trenton, New Jersey
M. H. Detrick Co.	Newark, N. J. and Peoria, Illinois
Empire Pattern & Foundry Co.	Tulsa, Oklahoma
Farrel-Birmingham Co., Inc.	Ansonia, Connecticut
Florence Pipe Foundry & Machine Co.	Florence, New Jersey
Fulton Foundry & Machine Co., Inc.	Cleveland, Ohio
General Foundry & Manufacturing Co.	Flint, Michigan
Greenlee Foundry Co.	Chicago, Illinois
The Hamilton Foundry & Machine Co.	Hamilton, Ohio
Hardinge Company, Inc.	New York, New York
Hardinge Manufacturing Co.	Grove City, Pennsylvania
Johnstone Foundries, Inc.	Charleston, West Virginia
Kenawha Manufacturing Co.	Milwaukee, Wisconsin
Koehring Co.	Los Angeles, California
Lincoln Foundry Corp.	Brantford, Ontario
London Concrete Company, Ltd.	Orillia, Ontario
E. Long Ltd.	Hamilton, Ontario
Otis Elevator Co., Ltd.	Palmyra, New Jersey
Polymyr Foundry Co., Inc.	Bridgewater, Massachusetts
The Henry Perkins Co.	Buffalo, New York
Pohlman Foundry Co., Inc.	Pittsburgh, Pennsylvania
Rosedale Foundry & Machine Co.	Chattanooga, Tennessee
Ross-Meehan Foundries	Dover, Ohio
Shenango-Penn Mold Co.	Indianapolis, Indiana
Sonith Industries, Inc.	Worcester, Massachusetts
Standard Foundry Co.	Denver, Colorado
The Stearns-Roger Manufacturing Co.	Allentown, Pennsylvania
Taylor Engineering & Mfg. Co.	St. Paul, Minnesota
Valley Iron Works, Inc.	Phillipsburg, New Jersey
Warren Foundry & Pipe Corporation	

"This advertisement sponsored by foundries listed above."



FRANCIS J. FRASOR
... Diversey purchasing agent



FRANK T. SHIBA
... a sales mgr., Builders Structural

inecticut, Earl C. Jex Jr. direct
representative in Michigan operat-
out of Detroit, and Francis T.
orley eastern district manager.

Francis J. Frasor was named pur-
using agent, Diversey Corp., Chi-
go. He served as procurement
ordinator for Koppers Co. Inc.
its Chicago office.

sociated Research Inc., Chicago,
pointed Donald A. Davenport
ef engineer and Paul Wade pur-
asing agent.

Charles W. Decker Jr. was named
istant sales manager, engine-
ision, Le Roi Co., Milwaukee.

Af O. Roberts was appointed dis-
ct sales engineer in the Chicago
ea for Granco Steel Products Co.,
sidiary of Granite City Steel Co.

Philip E. Campbell was made Pitts-
rgh district field engineer, SKF
ustries Inc.

BITUARIES...

en M. Fox, 67, former advertis-
; manager, Cleveland Cliffs Iron
, Cleveland, associated with the
n 20 years, died Apr. 1. He re-
ed three months ago.

uis Klow, 77, co-founder and
asurer, Grand Sheet Metal Prod-
ts Co., Melrose Park, Ill., died
ir. 25.

hn G. McKinnon, 81, former plant

Frank T. Shiba was appointed
anager of sales, structural and
ornamental divisions, Builders
tructural Steel Corp., Cleveland.

Robert H. Murphy was appointed
assistant production control man-
ager, AC Spark Plug Division, Gen-
eral Motors Corp., Flint, Mich.

John A. Borman joins Clark Equip-
ment Co. industrial truck division,
Buchanan, Mich., as assistant to
the vice president. He will work
on engineering and production
problems. For the last three years
he has been with Baker-Raulang
Co. Russell Hastings, formerly
with Lewis-Shepard Co., joins
Clark as assistant to A. O. Williams
in directing engineering activities.

Robert D. Weber was made director
of engineering for both Rosan Inc.
and Rosan Engineering Co., New-
port Beach, Calif. Arthur I. Lusk
was made chief engineer of both
companies. Brig. Gen. Stanley E.

manager, Pease Foundry Co. Ltd.,
Brampton, Ont., died recently.

Joseph S. Cowan, 59, manager of
government business at Washing-
ton for National Electric Products
Corp., Pittsburgh, died Mar. 31.

Otto A. Pfleger, 65, for 11 years
president, Radiant Tool & Die
Corp., Chicago, died Mar. 30.

Robert E. Dawe, 55, quality con-
trol director, North American

Ridderhof, U. S. Marine Corps, ret.,
joins Rosan Inc. as assistant to the
president. Harry N. Bailey was
elected vice president, Rosan
Thread Division, Rosan Engineering
Co. Colonel Bailey formerly
was the Air Force regional repre-
sentative, Los Angeles region.

Howard C. Holmes, former Detroit
district manager, was promoted to
assistant general sales manager,
Kaiser Aluminum & Chemical Sales
Inc. His headquarters are at Chi-
cago. Mortimer C. Crockett was
named to take charge of the De-
troit sales office with John J. Cas-
sidy succeeding him as assistant
district manager, New York.

N. A. Lamberti was appointed di-
rector of materials and L. S. Peck
director of industrial relations by
McCulloch Motors Corp., Los An-
geles.

Eugene Dirschel was appointed
works manager, Roberts - Gordon
Appliance Corp., Buffalo plant.
John Crim was named assistant
works manager.

Paul L. McCullough Jr. was made
sales manager, electro-alloys divi-
sion, American Brake Shoe Co.,
New York.

O. W. Carrico, formerly assistant
plant manager, Chicago division,
Houdaille-Hershey Corp., was ap-
pointed plant manager.

Lewis T. Gibbs was made assistant
manager of sales in U. S. Steel
Corp.'s high strength steel divi-
sion, Pittsburgh.

Sharon Steel Corp., Sharon, Pa.,
elected new directors: J. K. Hod-
nette, D. R. Linsley, F. J. Manheim.

Aviation Inc., Los Angeles, died
Mar. 28.

Hugh J. Beach, 60, president, Flex-
ible Steel Lacing Co., Chicago, died
Mar. 31.

C. B. Bohn, 73, founder and board
chairman, Bohn Aluminum & Brass
Corp., Detroit, died Apr. 2.

J. Gordon Turnbull, 62, president,
J. Gordon Turnbull Inc., died Apr.
1 at his home in Los Angeles.

Acquires Convair Control

General Dynamics buys controlling interest in western aircraft company from Atlas Corp.

GENERAL DYNAMICS Corp. will acquire a controlling interest in Consolidated Vultee Aircraft Corp., San Diego, Calif., with the purchase of Convair stock from Atlas Corp. General Dynamics will pay \$8.7 million and exchange 20,000 shares of its common stock for the 400,000 shares of Convair.

The purchase represents about 17 per cent of Convair's outstanding stock. Total value of the transaction amounts to about \$10 million.

For Defense Purposes—Association of General Dynamics and Convair joins two companies with a wide range of products, largely for defense. Sales of General Dynamics reached \$110 million last year, compared with \$82 million in 1951. Convair sales totaled \$390 million in 1952, and current backlog is over \$1 billion.

General Dynamics is parent company of Canadair Ltd., aircraft manufacturer of Canada, building transports and jet planes. The electric boat division of General Dynamics is working on a contract for an atomic submarine, besides other submarine contracts.

Atlas has not reported what it will do with funds from the sale.

Opens Birmingham Office

Mount Vernon Steel Corp., Mount Vernon, N. Y., opened a southeastern sales and warehouse headquarters in Birmingham.

Army Project for Goodyear

Goodyear Aircraft Corp., Akron, will design and develop a new field artillery carriage for the Army. Carriages will be lighter and more functional than present units.

Parker Buys Accessory Line

Parker Appliance Co., Cleveland, purchased the line of hydraulic accessories manufactured and in process of development by Sundstrand Machine Tool Co., Rockford, Ill.

Parker already produces hy-



U. S. Steel's Gary Works Produce 150-Millionth Ton

Steelmen watch the 150-millionth ton of steel produced at Gary Ind., W. of U. S. Steel Corp. Steel poured into these ingot molds helps attain the record, accomplished since 1909. Since then, highest yearly output was 6,380,000 tons in 1951. John H. Vohr, left, general superintendent, and Edgar Speer, center, division superintendent of steel production, observe the pour.

draulic accessories for aircraft and mobile equipment used in materials handling, in road building and in farming.

struction of a new plant containing 160,000 square feet is nearly complete in Houston.

Operates Packing Plant

E. F. Houghton & Co., Philadelphia, is operating a new plant for manufacture of synthetic rubber packings. The managing company is Houghton Vix-Syn Co., Hopkins, Minn.

Alpha To Sell Outside U. S.

Alpha Tool & Supply Co., Clifton, N. J., expanded its distribution to include Canada and Mexico. The company imports precision-made British industrial products.

CF&I Opens Mine Section

Colorado Fuel & Iron Corp. is now taking coal from the east portal of its Allen mine near Stoenwall, Colo. Coal production from the mine's west portal started in 1952 and has been increasing steadily.

The coal is shipped to CF&I's Pueblo, Colo., steel mills.

Opens Trailer Factory

The first unit of a trailer factory was put in operation by Clegg Specialties Inc. at Anaheim, Calif.

Grateful for Suggestions

Timken Roller Bearing Co., Canton, O., awarded \$46,045 to supervisors and production employees

D.O. James

Established
1888

CONTINUOUS-TOOTH HERRINGBONE GEAR REDUCERS

The Gear with the Backbone

Some of the Many Proven On-the-Job Advantages
of This Type of Gear Reduction Are as Follows

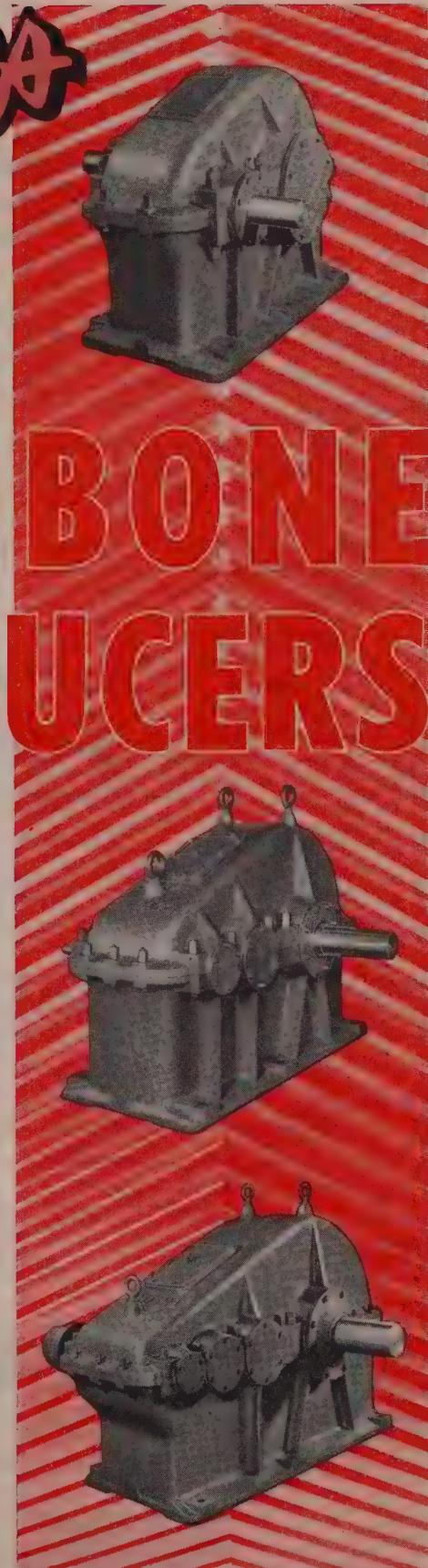
No side thrusts.
No avoidable deflections, distortions.
No necessity for bearings having
full capacity.
Stronger teeth, due to the arch-like
structure.
Greater load-carrying capacity due
to utilization of the full width of face.
More silent and smoother action due
to absence of distortion.
No impact stresses due to avoidance
of sideways deflections.
Uniform load across face due to balanced
thrusts of the opposing helices.
Better lubrication due to the oil film
generated by "wedge action" of the teeth.
Less costly to produce due to the
absence of side thrusts and no necessity
for heavy sections to reduce deflections — also due to the simultaneous
utilization of two cutting tools.

11. Can be substituted for straight tooth gears without any change in design of bearings or housings, or increase in face width, or alteration in pitch.
12. No axial float is necessary because the "V" shaped herringbone teeth wedge automatically into the mating gear thus eliminating all sideways motion and the consequent rubbing action of a screw-like nature existing in single helical gears which result in pitting and wear at relatively low loads.
13. Less expensive gear housings and bearing housings due to balanced thrusts.
14. Large helical angles are used; thus the full benefit of the helical principle is obtained.
15. Tooth deflection, though very small, results in the greatest load being carried by the strongest section.

All Gears are Generated Continuous-tooth Herringbone Gears,
20° pressure angle, 30° helix angle

Send for Catalog 40-C

D.O. JAMES GEAR MANUFACTURING CO.
Established 1888 • Makers of Every Type of Gear and Gear Reducers
40 W. MONROE STREET • CHICAGO 7, ILLINOIS



**It's hard to beat a
specialist in his own field!**

**with CLEVE-WELD,
it's STEEL RINGS**

For any type of circular rolled or welded parts in quantity, chances are you can't beat Cleve-Weld...for quality, uniformity and price!

Whatever your requirements in this specialized field, it will pay you to consult Cleve-Weld. Forward your drawings and specs for free estimate. Out of their broad experience, Cleve-Weld engineers can frequently offer suggestions for slight design changes that will add strength to the part...or reduce its cost of production. Write for general catalog today.

See AMF's exciting, new television show, "OMNIBUS". Check your local paper for time and channel.



CLEVE-WELD

Specialists in

RINGS • BANDS • WELDMENTS

THE CLEVELAND WELDING COMPANY

West 117th St. & Berea Road, Cleveland 7, Ohio

a Subsidiary of

AMERICAN MACHINE & FOUNDRY COMPANY, NEW YORK

in 1952 for 1120 suggestions ward increasing production, cutting waste and improving safety.

Powers Moves Installations

Powers Wire Products Co. moved its Los Angeles plant and offices to Monterey Park, Calif.

Chemical Plant Finished

Eagle Chemical Co. completed plant for production of desiccants and industrial coatings in Mobile, Ala.

A-C Names Distributor

George L. Smith & Co., Milwaukee, will distribute motors and centrifugal pumps in sections of Wisconsin and Michigan for Allis-Chalmers Mfg. Co., Milwaukee.

Opens Sales Office

Pennsylvania Falk Chemical Co., Pittsburgh, opened a general sales office in the Farmers Bank building, Pittsburgh.

Receives Second TVA Order

Westinghouse Electric Corp. Sturtevant Division received a \$406,000 order for fan equipment from the Tennessee Valley Authority's Rogersville, Tenn., station. A previous order totaling \$750,000 was placed with Sturtevant earlier this year for use at TVA's Kingston, Tenn., station.

Offices for Perry Kilsby

Perry Kilsby Inc. has new offices and a warehouse at 2501 South Malt Ave., Los Angeles.

Toledo Plant Opened

Master Chemical Corp., Toledo, O., opened new offices and plant in Toledo. Master Chemical manufactures a water soluble coolant for machine tools.

Win Safety Awards

The National Constructors Association gave awards to eight member companies for outstanding safety records last year.

Winners were Bechtel Corp.,

Just as a goalie needs protection...



**IRON and STEEL
Need PROTECTION**

If your product is made of iron or steel, and exposed to the elements, protect it against the ravages of rust by Hot-Dip Galvanizing — the best possible rust preventive when applied by Hanlon-Gregory. For longer life, greater uninterrupted service and substantial savings in maintenance, specify Hot-Dip Galvanizing . . . SEAL IT IN ZINC.

HANLON-GREGORY GALVANIZING COMPANY

Pittsburgh, Pennsylvania
The World's largest Job Galvanizing Plant
A. J. DIEBOLD, President

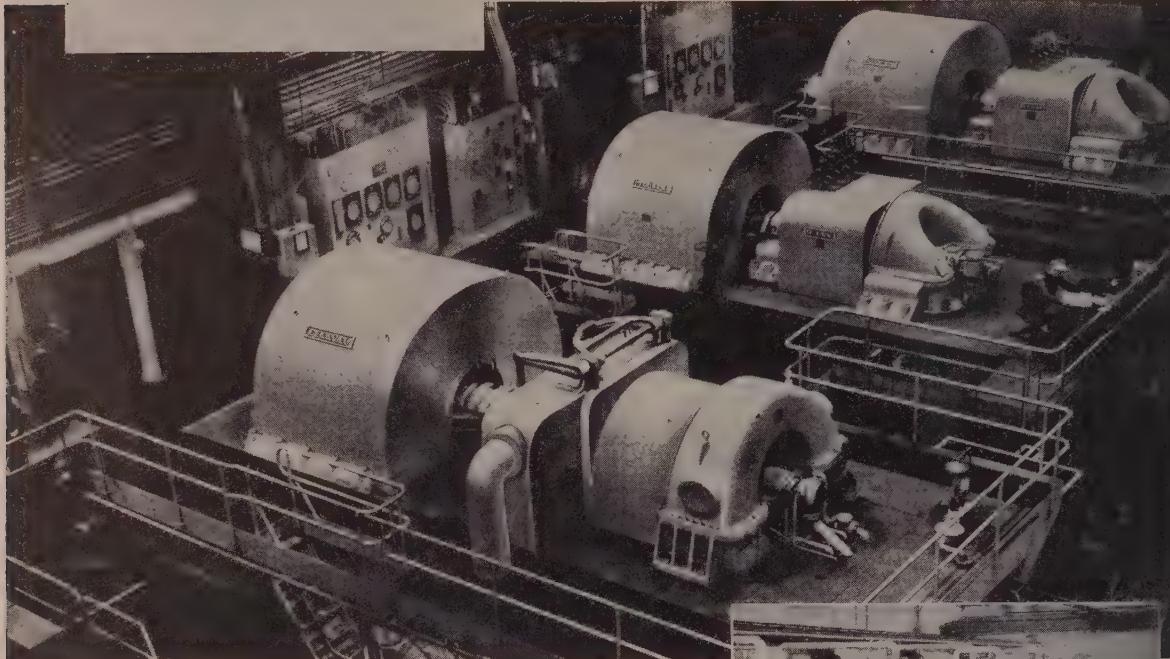
galvanizing . . . pickling . . . painting . . . oiling

IN THE HEART
OF THE STEEL INDUSTRY



DE LAVAL
STEEL MILL
BLOWERS

never take a "breather"

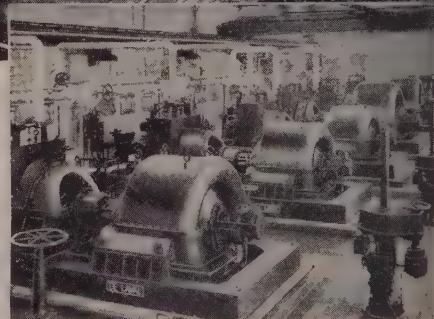


De Laval turbine-driven blowers: one rated at 123,000 cfm, others at 97,800 cfm.

These De Laval turbine-driven blast furnace blowers and coke oven boosters and exhausters stay on the job 'round the clock in steel plants all over the country.

There are good reasons for this power-saving dependability. De Laval heavy-duty blowers are built to take punishment. Rugged casings, husky, perfectly balanced rotors, cylindrically seated bearings are design features that reduce maintenance and insure long continuous service. Remember, there's no divided responsibility—both turbine and blower are De Laval designed and De Laval made.

For a quarter of a century, De Laval has pioneered in advanced blower engineering designs and practices. In fact, the first turbine-driven units to use steam at pressures above 700 psig and temperatures above 825°F TT were manufactured by De Laval. Centrifugal blowers and compressors are built in single and multi-stage types for delivering air in volumes as high as 125,000 cfm or more for all classes of service in steel, gas and coke plants. Put this experience to work for you. Discuss your specific applications with a De Laval Sales Engineer.



De Laval turbine-driven coke oven boosters and exhausters installed in an eastern steel mill.



Three 110,000 cfm De Laval turbine-driven blast furnace blowers at a midwest steel plant.



DE LAVAL

Centrifugal Blowers

DE LAVAL STEAM TURBINE COMPANY

860 Nottingham Way, Trenton 2, New Jersey



It Is Timesaver

hydraulic lift mounted on a Chevrolet truck saves time and labor in laying heavy water lines. Here one such truck is operated by Gary-Hobart Corp., Miller, Ind. The driver works controls from his dashboard

ancisco, H. K. Ferguson Co., Cleveland, Fluor Corp. Ltd., Los Angeles, Lummus Co., New York, Thur G. McKee & Co., Cleveland, st Engineering Co., Pittsburgh, ocon Inc., Chicago and Stone & Webster Engineering Corp., Badger ocess Division, Boston.

Dravo Receives Order

Dravo Corp., Pittsburgh, will construct facilities for unloading coal barges at the Philip Sporn plant of the Ohio Power Co. and the Appalachian Electric Power Co. at Graham Station, W. Va.

Employees Buy Company

Two veteran employees of Buffalo Bearings Inc., Buffalo, purchased the company. Floyd H. Shrader will be president and secretary and James P. Cavanaugh is vice president and treasurer.

Harrisburg Buys Heckett

Stockholders of Harrisburg Steel Corp., Harrisburg, Pa., approved acquisition of Heckett Engineering Co., Butler, Pa., and its wholly-owned subsidiary, Heckett International Inc.

Heckett Engineering operates

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5TH NATIONAL MATERIAL HANDLING EXPOSITION



Forges Huge Ingot

U. S. Steel Corp.'s Homestead, Pa., works forge a 500,000-pound ingot for use in the Air Force heavy program. It will be reduced to two-thirds in diameter and lengthened 63 feet, to be used as a tie rod in a 20,000-ton extrusion press to produce intricate parts for aircraft.

slag reclamation facilities in steel plants in the U. S. and Canada.

New Chicago Office

Pratt & Whitney Division of Niles-Bement-Pond Co., West Hartford, Conn., relocated its Chicago branch office at 4649 West Fullerton Ave.

Purchases Leader Assets

Benjamin Electric Mfg. Co., Elgin, Ill., purchased certain sets of Leader Electric Co., Chicago. Leader products are to be manufactured and sold by the Leader Division of Benjamin Electric.

Louchheim Distributes Kitchens

Stuart F. Louchheim Co., Philadelphia, will distribute steel kitchens manufactured by Berger Kitchen Division of Republic Steel Corp., Canton, O.

NPA Lists Tool, Die Makers

The Office of Small Business, National Production Authority, published a directory of independent tool and die manufacturers. The material was gathered by



How

SHELL MOLDING

Pays off!

The shell molding process offers notable economies to the producer and user of ferrous and non-ferrous castings on short as well as long runs.

LONG RUN PRODUCTION. Shell molds yield castings almost pattern-smooth, with tolerances as close as .003 to .005 inches per inch. This feature greatly reduces finishing costs. Moreover, there is a high percentage of sound, uniform castings, with fewer rejects.

SHORT RUN PRODUCTION OF COMPLEX SHAPES. Such castings normally require finishing entirely by hand—at prohibitive cost. Shell molds are made of a resin-sand mixture that is perfectly suited to forming on intricate pattern plates. Shell molds can be stored without deterioration for intermittent production scheduling. They retain their shape until used.

SELECTION OF PROPER RESINS. BAKELITE Phenolic Resins are used to bond the fine-grained sands from which the thin, lightweight shell molds are made. Bakelite Company has developed several resins for this process, of which two meet most requirements. One provides resistance to distortion during the initial heat of pouring. The other provides accurate reproduction of intricately-detailed patterns, even those requiring deep draws.

ENGINEERING GUIDANCE. Selection and use of the correct bonding resin is important to successful shell molding. It is a step for which your foundry department or supplier may need expert guidance. Bakelite Company engineers, located in principal cities, are ready to help. Write Dept. PK-49.

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Cleaning by Sound

Sound waves, newly developed method of industrial cleaning, are being used at Minneapolis-Honeywell Regulator Co., Minneapolis, to wash delicate bearings. To be used for high pressure gyroscopes, the bearings are placed in a beaker holding cleaning fluid. Later high-intensity ultrasound waves will pass through the agitated beaker, cleaning the bearing

National Tool & Die Manufacturers Association.

About 1500 producers of special dies, molds, jigs, fixtures, gages and machines are listed. Copies can be purchased from the Department of Commerce, Division of Printing Service, Distribution Section, Washington 25.

Alcoa Plans Presses

Aluminum Co. of America plans to install two extrusion presses, at a cost of \$2.7 million, in its Vancouver, Wash., plant. The extrusion plant will contain 80,000 square feet of manufacturing space. Plant employment will be increased to 2000.

Award Crane Contract

Government engineers awarded a crane contract for Lookout Point Dam, Portland, Oreg., to Harnischfeger Corp., Milwaukee.

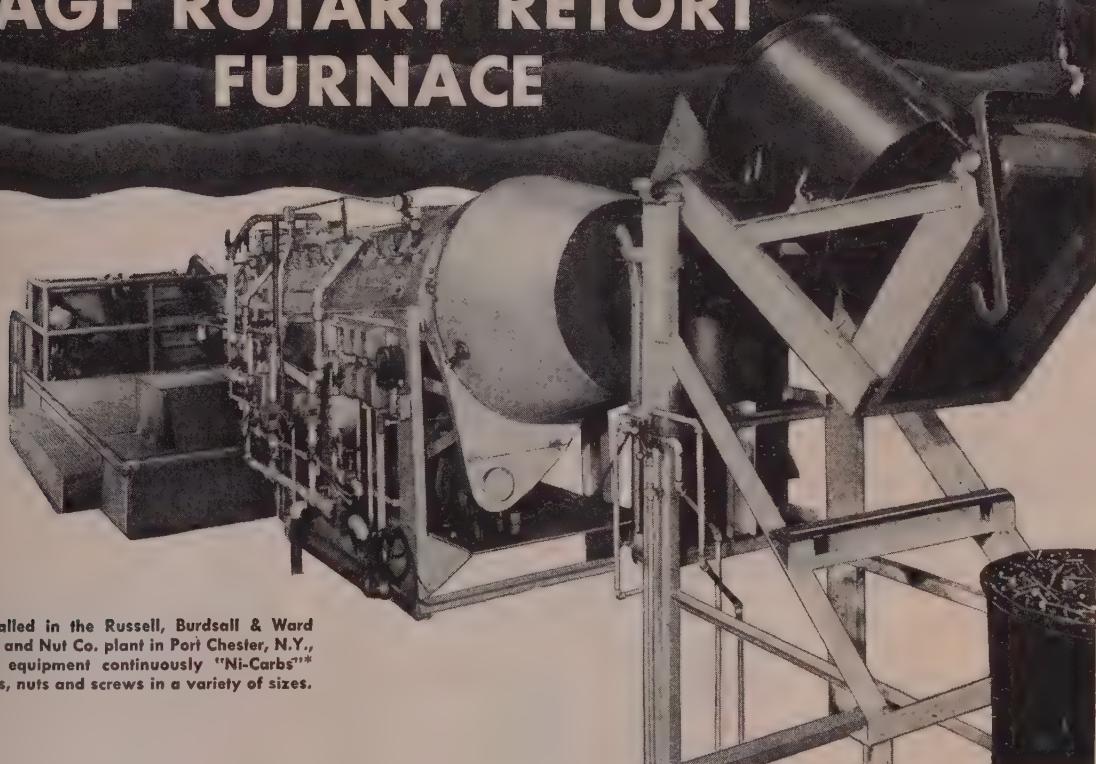
Hooker To Build Addition

A permit for a proposed \$396,000 plant addition was issued to Hooker Electro-Chemical Co., Taconic, Wash. The general contract at

NEW! Oil or Water COMBINATION QUENCH TANK

increases the versatility of the

AGF ROTARY RETORT FURNACE



Installed in the Russell, Burdsall & Ward Bolt and Nut Co. plant in Port Chester, N.Y., this equipment continuously "Ni-Carbs"** bolts, nuts and screws in a variety of sizes.

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*The Original Ammonia-Gas Case Hardening Process.

- Positive control and maintenance of atmosphere in the retort.
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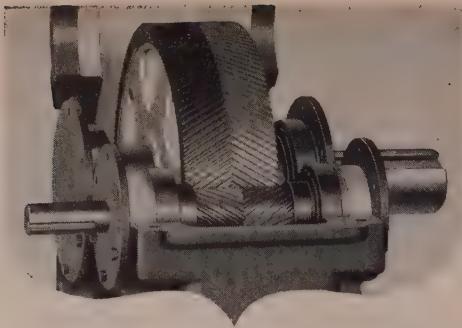
The overall economies of operation afforded by AGF Rotary Furnaces result in substantially lower cost per unit of work heat treated than is possible with any other type of furnace.

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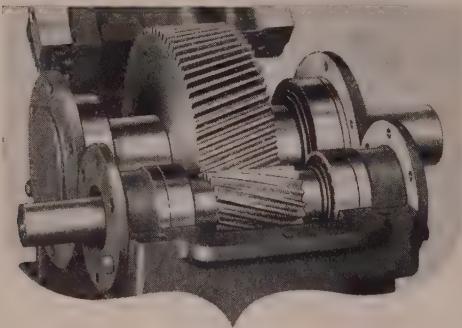
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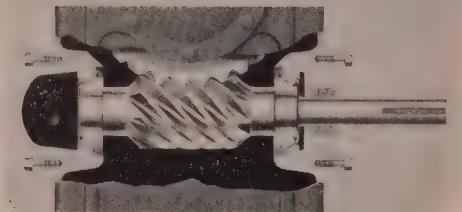




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Utah Begins AEC Facilities

The Atomic Energy Commission awarded a contract for the first phase of construction of ground facilities at the Arco reactor test station, Idaho Falls, Idaho, to Utah Construction Co., Salt Lake City, Utah, on a bid of \$4,583,028.

Building, pumping facilities and tanks are involved in the contrac-

Lockheed Sales Soar

Lockheed Aircraft Corp., Burbank, Calif., reported sales, earnings and backlog reached postwar heights during 1952. Sales rose \$438,120,000 — a considerable increase from \$237,230,000 in 1951. Backlog has risen to approximately \$2 billion.

In other news from the company, Lockheed has established a leadership fund to finance 20 four-year college scholarships, in a nation-wide program to attract students in engineering and industry.

Builds Control Plant

Minneapolis-Honeywell Regulator Co. started construction of a west coast plant at Gardena, Calif., for manufacture of automatic controls for water heaters, floor furnaces, wall heaters and central heating plants.

The first unit, a machine shop, is scheduled for completion next June. Employment is expected to reach 2000 persons.

Air Products Builds Generator

Air Products Inc. will build a liquid-oxygen generator 60 feet high at its Emmaus, Pa., factory. The unit will be used by Grace Chemical Co.'s planned ammonia and urea-fertilizer plant in Weddington, Tenn.

Using only air as a raw material, the generator will produce more than 200 tons of oxygen and 90 tons of nitrogen daily. It will cost about \$1 million.

With the high-pressure oxygen equipment, Grace Chemical will produce ammonia by a new, low-cost process for partial oxidation of natural gas.

Send note on Company Letterhead for Speed Reducer Catalog 46



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ROEBLING makes the finest high carbon wire available to industry today. Roebling wire is absolutely true to specifications...absolutely uniform in gauge and finish. Manufacturers who try Roebling wire once, become Roebling customers from then on.

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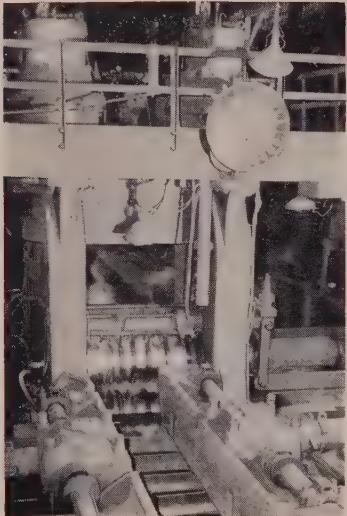
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Control room in large steel plant showing EC&M TAB-WELD Resistors used with mill controllers.

... and not one cent
for maintenance



Blooming Mill Screwdown Controller
—EC&M Bulletin 925 Mill Type with
LINE ARC Controllers and TIME CURRENT
Relays—famous for low upkeep,
too.

Throughout this large steel mill, thousands of EC&M TAB-WELD Resistors have been giving trouble-free service on hard-worked, heavy duty applications. Not one cent has been spent for maintenance — NO BURNING.

When an accident smashed the end-frames and spacers of two sections, there was NO LOSS in production. Even under the damaged condition, the circuit remained intact due to TAB-WELD'S all-welded construction.

Also important are—the many taps which make on-the-job connections or adjustments easy. And, too, these resistors are corrosion-resistant.

**For topmost performance specify
EC&M Bulletin 942 TAB-WELD Resistors.**

THE ELECTRIC CONTROLLER & MFG. CO.
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LLOY PLATE—A new zinc-iron alloy electroplate looks promising as a bright corrosion resistant plating for steel and may even be used as a substitute for nickel prior to chromium plating. British Iron & Steel Research Association reports that a plating of 5 per cent zinc and 95 per cent iron is hard, nearly mirror bright and has good adherence to steel. Alloy coatings with more zinc have better corrosion resistance but are not as bright. An electroplate of one-third zinc two-thirds iron is silvery in color and the corrosion resistance is comparable to galvanized coatings.

REAT MAGNESIUM—A new chemical treatment for magnesium produces a complex chromium chromate on the surface which is highly resistant to corrosion. Developed by Allied Research Products Inc., the protective finish is dark brown in color and will not chip, flake or peel when bent since the coating is an integral part of the metal itself, rather than a superimposed film. The coating is formed by simple immersion of parts in a water solution at room temperature.

LUSIVE FACTORS—One of the hardest factors of machining to pin down is that of cutting fluids. In almost all cases, some kind of a fluid will improve the machining operation, lengthen tool life and improve both quality and quantity of machine output. Many variables, however, cloud the picture and make it tough to tell just which fluid property or properties are needed for any one operation. Although these properties are not independent, they can be separately recognized and studied. An example of improvements accruing out of proper application is the gain in a drilling operation when the fluid is applied through the drill to the point of contact. There are more, too. p. 106

ROOF POSITIVE—When a machine tool salesman ran into a skeptical client recently, he had to figure a way to prove the ways of the machine were hard enough to resist abrasion. He got a small sample of the way material, ground it into a cutting tool form and put it in a lathe. Result: The way-tool cut chips and the machine was sold. Don't put up your machine for tools, though. It's still cheaper to buy standard cutters.

TEADY WORKER—Round-the-clock operations in a Baird Associates spectrometer play an important role in the steelmaking process at Weirton Steel Co. The work load consists of samples from 13 open-hearth furnaces and three blast furnaces along with a billet, mill and metallurgical samples. About 100 determinations per day are handled by one operator with help from a second man about one-third the time. Preliminary samples are taken from the molten bath in the open hearths from 1 to 3

hours before tap time and sent to the laboratory by pneumatic tube system. This procedure allows the melter to determine whether the melt will meet analytical specifications. Ladle samples at pouring insure a proper finished analysis. Time savings of about one hour per heat allow preliminary samples to be taken nearer tap time and assure that these samples are more representative of the melt. No delays are experienced by melt shop or rolling mills from lack of analysis. Savings in laboratory costs are estimated at \$13,800 per year.

HERE TO STAY—Originally application of ceramic coatings on alloy steel parts was thought of as a measure to save critical metals. Many of these uses are now so well established and proved in service that they will continue after shortages are alleviated. The fact that lesser alloys or even carbon steels protected with ceramic coatings can match or exceed the performance of the highest priced alloys has obvious economic advantages. Mass production techniques are being applied to the coating process bringing costs down and making it possible for volume producers to be assured of an adequate supply.

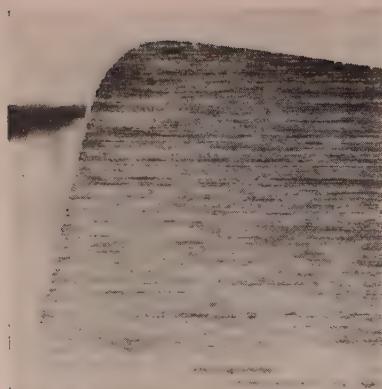
p. 110

BATTERY LONGEVITY—Constant improvement by the battery makers has raised the life of industrial storage batteries from an average of 24 months in 1923 to the present 72 months. Current development work is expected to add another 10 to 20 per cent to battery life. Included in the overall program are improved maintenance procedures as well as a better product. Despite the strides made in longer battery life, claims advanced for additives are discounted by most of the battery makers.

SAVING ZINC—Each year the wire galvanizing industry incurs a considerable loss because of oxide and dross formation. This problem has long been recognized and various methods used to combat it. A liquid blanket utilizing regenerative crystals that tend to maintain its fluidity has numerous advantages. These include: Lower dross formation, virtual elimination of noxious oxide fumes, reduction of prefluxing costs, reduced heat losses and increased production of galvanized work per ton of zinc available in workhouse stocks.

p. 138

PROBLEM IN MINIATURE—Diminutive parts used in some manufacturing processes sometimes are production bottlenecks just because of their size. Good example is the application of small screws—you can put 2000 of them in a teaspoon—used in eyewear frames. At the Shuron Optical Co. plant in Rochester, N. Y., these screws are being handled automatically by a new power screwdriver with a blade about as thick as four human hairs.



Progressive failure of a single-point lathe tool operating under heavy-duty conditions. Advance is from new tool, at left, through the typical crater on the rake surface to the disintegrated point of the failed tool

Cutting Fluids: THEIR ROLE IN MACHINING

Study shows how the four basic properties of a cutting fluid affect tool failure due to heat, wear and welding. Effect on surface finish is also studied

MAJOR PROPERTIES of a cutting fluid from the viewpoint of cutting performance are its ability to flow to the cutting area, to wet the metal, to remove heat and to reduce friction.

Practical results of concern to engineers, such as tool life and surface finish, are products of mechanisms which are affected by both cutting fluid properties and operating variables. It is important to establish the links, fluid property-mechanism-result, so that in any particular case, attention can be given to those properties which control the dominant mechanism for that particular set of operating conditions.

For example, in a drilling operation where drill margin pickup leads to seizure, tool life might best be improved by the use of anti-welding additives in oil. On the other hand, in a high-speed, medium cut lathe operation, maximum tool life might require the excellent cooling properties of water.

Overlapping Effects — The fluid properties are not independent of each other and their effects

also often overlap. However they can be separately recognized and in many cases modified. Flowing to the area of cutting action, depends largely on the viscosity of the fluid. The wetting property will determine the degree to which the fluid directly contacts metal surfaces and is primarily important under adverse conditions of pressure and temperature, where insufficient wetting will lead to squeezing out of the fluid.

Inherently then, cooling under such conditions will also depend on the wetting property. This is also the case where the coolant cannot be directed straight on to the cut, but must spread to that area along the metal surface. In the absence of sufficient flow and wetting, a relocation of the coolant jets to bring the fluid to the critical tool areas can sometimes effect a significant increase in tool life. Cooling, in the sense of heat removal, depends on the specific heat of the fluid,

boiling temperature and heat evaporation.

Surface Breakdown — Practically all machining operations produce conditions which preclude the use of film lubrication. Under the resulting boundary conditions viscosity is a minor factor, and oiliness a large one.

Under extreme conditions, where even this regime can no longer provide a film to carry the load, and welding would result, extreme pressure agents must be used which according to the best available theories react with the metal surfaces to form an extremely thin, sheared surface layer. The effect thus also is one of reducing friction, but while ordinary boundary lubrication interposes some degree of thin film between the rubbing surfaces and thus protects the surfaces against attrition, EP agents, by their very action, which is usually called corrosive, destroy the metal surface.

Group Reaction — These three properties of the major fluid properties of significance in metal cutting. In an actual cutting operation they are not always readily distinguished.

Based on a paper by S. J. Acsubien and A. G. Cattaneo, Shell Development Co., Emeryville, Calif., presented at the Conference on Metal Cutting, Massachusetts Institute of Technology.

for example, in a particular application a change in fluid properties is a lower tool point temperature, then an improvement in any of the properties might have been responsible. In such a case analysis of the cutting mechanism, or one of the fluid properties or both, will indicate the property responsible.

base Fluids Described—Water is excellent coolant by virtue of its specific heat (which is reduced by practically any type of additive) low boiling point and heat of evaporation. Its viscosity is very low, and thus it flows easily to the desired point.

Water also wets clean steel well, its wetting properties towards which are not clean are readily enhanced by the addition of additives. It is exceedingly poor as a coolant under boundary conditions, and although this property can be improved by additives, in current practice water most often is combined with mineral oil as a so-called soluble oil.

Friction Reducers—Mineral oils cover a wide range of viscosities, much higher than that of water, and therefore more difficult to get on to the scene of the cutting action. They wet steel as well as water when it is clean, and much better when it is not. Their cooling property is very inferior to that of water. Ability of mineral oils to reduce friction under boundary conditions is outstanding, and can be further enhanced by the addition of fatty acids or other oil soluble compounds containing polar groups.

With EP agents, usually oil soluble compounds containing chlorine or sulphur, the severity of the conditions under which they maintain low friction can be further extended.

Tool Life

Excess Heat—Tool failure caused by the sudden shearing away of the tool point usually is preceded by the reduction of some critical tool cross-section, such as cratering in a lathe tool, which weakens the tool structurally and raises the point temperature by creating a heat dam.

Alternately, the same type of failure may occur after gradual tool wear has rearranged the forces so that excessive heat is generated at the tool point, melting the tool.

Keep Cool—In this type of failure cooling will accomplish large improvements in tool life. When various fluids are compared, the dominant effect of cooling is evident. Changes in viscosity of the oil had no effect.

However, in some metalcutting processes such as a severe drilling operation, even for conditions where this type of tool failure controls tool life, coolants are not effective because they can't reach the tool point in sufficient volume.

To the Point—Addition of a wetting agent to water can increase the drill life threefold. Even more effective is the use of a hollow drill to deliver water directly to the drill point. A 15 to 20-fold increase in

drill life can be obtained in this way.

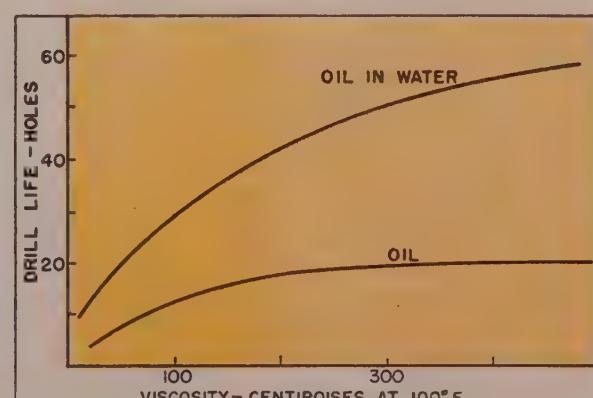
When EP agents are added to a mineral oil, this kind of tool life is increased a small but significant amount. Other variations in friction-reducing property of the fluid have no effect.

Second Glance—When the coefficient of friction between the chip and the tool is computed from dynamometer data for an uncompounded oil and one containing an EP agent it might seem that the reduced friction would mean less heat generated at the chip and tool interface.

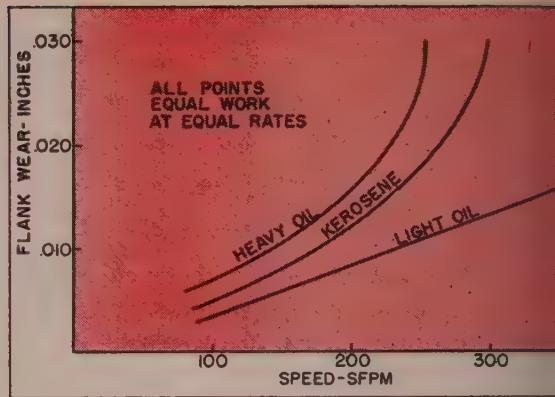
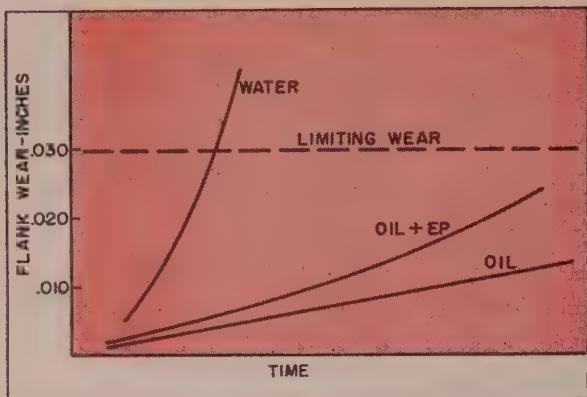
However, when the friction work and the shear work are computed the reduction in the coefficient of friction by the use of the EP agent has only a negligible effect on friction work and almost the entire advantage appears as a reduction in shear work.

External Is Best—Result of reduced shear work is a cooler tool point. However there is less advantage in this respect than if friction work had been reduced, because of the concentration of energy at the tool-chip interface for the latter case. Even so, this mechanism results in increased tool life for those applications where the tool normally fails from excess heat. However it does not compare in this respect to adequate external cooling.

For example, under conditions giving a 60-minute tool life in lathe turning of AISI 4340 steel with water, oil had about a 10-minute life and oil plus EP agents had about



Graphs show effect of cooling, left, and viscosity on drill life. For test 3/8-inch drill was used at 1240 rpm, 0.006-inch feed per revolution and 1-inch depth. Note gain when fluid goes through drill to the point



Effects of lubrication, left, and viscosity on tool wear in lathe turning. In both cases AISI 1020 steel was used for the test runs with HSS tools

a 15-minute life. Adding a wetting agent to the water gave no improvement over the result with water alone, indicating that in this case, as in most lathe turning, an adequate supply of coolant was already reaching the tool point.

Short Life by Wear—Second kind of tool failure is one in which the tool gradually wears to a degree such that dimensional or surface finish tolerances cannot be met, or tool load is excessive, or the limit for economic salvaging of the tool is reached. In all cases this failure results from a gradual change in tool dimensions, usually with no sudden change in the quality of the product produced.

Under these conditions reduction of friction appears to be the most important property of the fluid and oil is far superior to water. Addition of an EP agent has only a small effect, sometimes beneficial, but more often it produces faster wear, attributable to the corrosive action of the additive.

Like Water—One might expect that oil in water emulsions would give results falling between each of the components. However, at water dilutions and with oil viscosities commonly used, the results are not significantly different from water alone. An exception to this occurs with the newer heavy duty emulsions containing EP agents; with these fluids the performance may approach that obtained with EP agents in oil.

With wear-limited tool life, viscosity is important. In a drilling operation for example, oil viscosity can modify tool life by about a fac-

tor of three; this is true whether the oil is used neat or in oil-and-water emulsions.

Viscosity Important—For lathe cutting at moderate metal-removal rates where wear controls failure, there is also an advantage for increasing viscosity, but mechanical factors may limit the use of this fact. When a light mineral oil was compared to a kerosene fraction and to a heavier oil the light mineral oil was consistently best and showed the greatest advantage at high speed.

Results undoubtedly depend upon test conditions, and will vary with tooling and procedure changes. Apparently in this work the heavy oil was too viscous to flow adequately to critical wear areas, especially at high speed. Both kerosene and light oil gave tool protection but since the more viscous material was best, it seems that viscosity is important for this kind of tool life, probably through a reduction of the metal to metal contact, or friction.

Cooling has no significant effect on this type of tool failure. It does not appreciably affect the wear rate of a moderately loaded tool.

Weld Effect—Third kind of tool failure results from welding of workpiece material to the tool. In many instances this process may be desired to some degree. An example is the built-up edge on a lathe tool. In drilling or reaming, however, pickup on the tool may seriously limit its further use.

EP agents in oil have a pronounced effect on this mechanism, often increasing tool life by as

much as 10 or 20-fold. Cool with water alone has a lesser appreciable effect in some applications, and oil alone has no significant effect.

Double Action—At this point effects should be considered of agents on tools which fail by sequence of wear and welding. Vere drilling, at about four diameters deep in a steel like annealed AISI 4340, provides an interesting example.

Failure occurs through the following chain of events: Wear occurs on the cutting edge near periphery where the surface speed is highest; as the drill advances into the resulting tapering hole the drill margin clearance is reduced to zero and the friction in the highly loaded area causes welding of the drill margin to the workpiece. For this application, water alone was compared with agents in oil; it was found that corner wear was less for oil alone. However, a fluid of EP agents in oil is so much better able to tolerate high load resulting from wear that ultimate tool failure from wear is postponed and drill life is prolonged greatly.

Surface Finish

Somewhat less clearly defined but nevertheless exhibiting distinct differences, are the processes governing relationships between tool properties and surface finish.

Single Contact Cutting—Large of academic interest, but practical to a limited extent with some tools is the surface finish produced

single contact of the tool. In the laboratory this is accomplished by cutting a continuous chip on the end of a tube; in practice, a rough approach is an example.

Cooling seems to have a slight negative effect on surface finish in this type application. For some operating conditions, dry, mineral oil and water, were found to give slightly increasing roughness in order. Apparently the chip is sheared more cleanly from the workpiece when the chip and tool are at higher temperatures. When surface is reworked by the tool small advantage is lost. Neither oil alone, nor EP agents in oil had any significant effect. Viscosity was not evaluated.

Multiple Contact Cutting — In most practical applications the main cutting edge of the tool generates an endless transient surface, the chip, which is discarded. The finished workpiece surface is formed by successive passes of the tool point as it is fed across the work. In simplest terms, most practical metal cutting shears the chip from the work and then both shears and burnishes the surface in subsequent passes of the tool.

Effect of cooling is usually negligible. In lathe cutting for example, cutting dry, with water, or with mineral oil gave about the same finish throughout a range of speeds. The question of changed viscosity does not appear to enter here since the coefficient of friction is the same for each fluid at any given speed in this application.

Field for EP — Oil alone has little effect on surface finish. However,

EP agents in oil are quite effective for improving finish in the re-worked surface processes.

Although much work has been done on control of mobility of the built-up edge with EP agents, and the subsequent effect on surface finish, these data together with the negligible effect found in single contact cutting, suggest that EP agents are most useful when they enhance the reworking and burnishing action of the tool. They probably function by preventing surface irregularities and portions of built-up edge which have escaped onto the workpiece, from re-welding to the tool and being plucked from the surface.

In the Tight Spots — Since the primary effect of wetting agents is increased cooling, and since cooling alone has little direct effect on surface finish in the usual applications, normally wetting agents do not influence surface finish. Exceptions are found in applications with restricted cooling which cannot tolerate tool pickup without loss of surface quality.

Drilling and boring are common examples of these applications, while a wide plunge cut on a lathe represents a less common but just as susceptible a process. The latter cut is usually inadequately cooled because the fluid is diverted from the tool point by the chip and the dam created by both sides.

Thread Cutting — No general physical differences between the conditions for thread cutting with dies and those for general multiple contact cutting are apparent, except that the small diameter thread

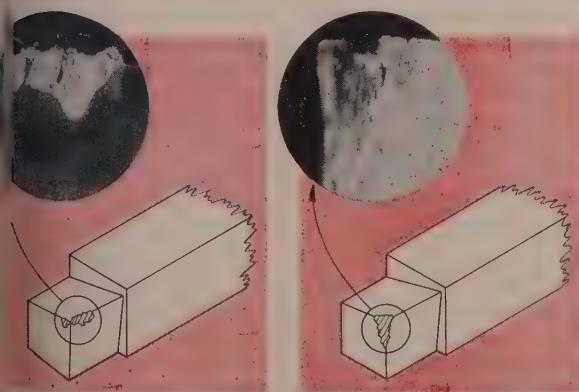
(1/2-inch) studied here, together with the use of a four chaser die, permitted only a short time interval between tool contacts at reasonable surface speeds.

Nevertheless, in thread cutting with dies, cooling has a decided beneficial effect on surface finish while it has none in multiple contact cutting. This discrepancy is so pronounced that this operation is probably particularly sensitive to pickup, and it is the reduction of pickup through cooling which accounts for excellent thread finish. EP agents also produce a fine finish in this operation.

Tool Forces

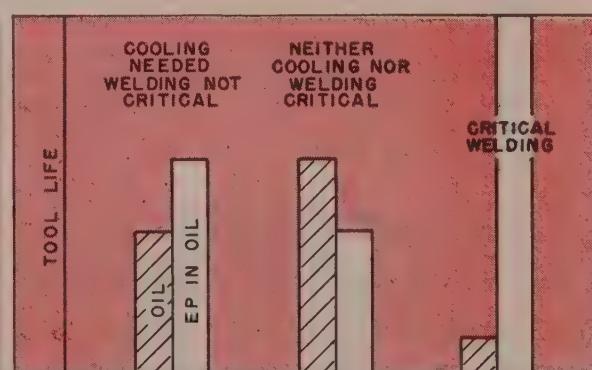
No significant effect of cooling on the magnitude of the resultant tool force has been found. One might at first think that cutting dry would raise the temperature sufficiently to lower the shear strength of the metal in the shear plane. If the shear strength is calculated from dynamometer and cutting ratio data, it is found that dry, water, and mineral oil, have no effect.

Oil alone has only a little effect on tool forces. However, EP agents in oil reduce the total tool load by as much as 40 per cent. In many cases this will not be of particular interest to the user since power cost is usually not important and machines are designed to tolerate high loads. However, some machines, such as drill presses, are frequently torque limited, and the reduction in torque possible with EP agents permits a significant increase in machine productivity.



Inset and inset show nature of tool wear by gradual wearing of flank face on single-point lathe tool

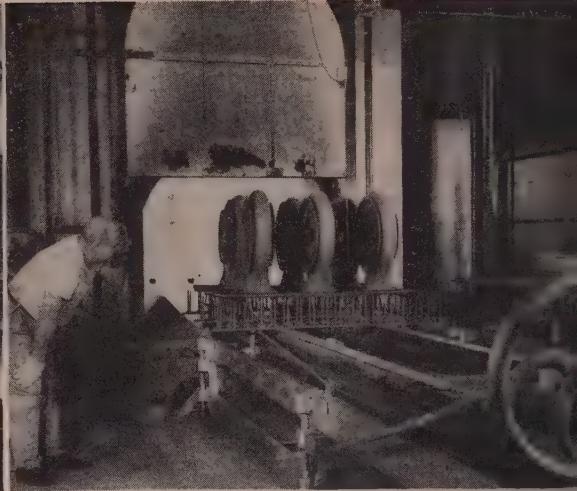
Failure of a single-point lathe tool by sudden shearing of the hot point under heavy-duty operating conditions



Bar chart shows typical effects of EP agents on tool life limited by cooling, wear and welding of work to tool



Internal surfaces that cannot be sprayed are coated by squirting mixture inside, rotating part and draining



A batch of nozzle boxes is shown moving into firing furnaces where 0.001-inch coating will be fused to metal

Ceramic Coatings Boost Alloy Steel Use

What started out to be an emergency measure to save critical metals is gaining more applications in the field of permanently finished metals. Mass production is helping

SUCCESSFUL development of mass production facilities devoted exclusively to high temperature ceramic coatings of metal parts establishes a vast new potential for the use of high alloy steels in our industrial economy. Developed to meet critical metal shortages, these coatings also hold promise of reducing costs through lower maintenance and longer life.

Short supplies of tungsten, cobalt, columbium, molybdenum and nickel posed great problems in the production of high temperature metals for engine parts and special performance equipment. Many items which required the very highest alloy metals can now get equal or greater life from coated lesser alloys or even carbon steels.

Future Tremendous—In all production fields using metals subject to oxidation and corrosion alone—such as automobile parts, heating systems and furnaces, civilian and military aircraft engines and parts—the future of high temperature ceramic coatings is tremendous. Cost of maintenance of nonperma-

nently finished metals used for industrial, domestic and other purposes is great when one considers replacement, labor costs, and losses due to the immobilization of valuable equipment for varying lengths of time.

Aside from saving critical metals, one of the greatest advantages of high temperature ceramic coating is the extension of life of the metal part. Life expectancy of coated steel parts is from two to three times that of uncoated parts in temperatures in excess of 1500° F. Under somewhat lower temperature conditions, these coatings have shown a tendency to prolong part life almost indefinitely.

Wider Applications—Until recently the advantage of high temperature coatings has been available exclusively to high priority, specialized production, such as jet engine parts. Recent production has been extended to nozzle boxes, exhaust hoods, collector rings, cooling caps, exhaust manifolds, diffuser cones, combustion chambers, nose heaters, heat exchangers,

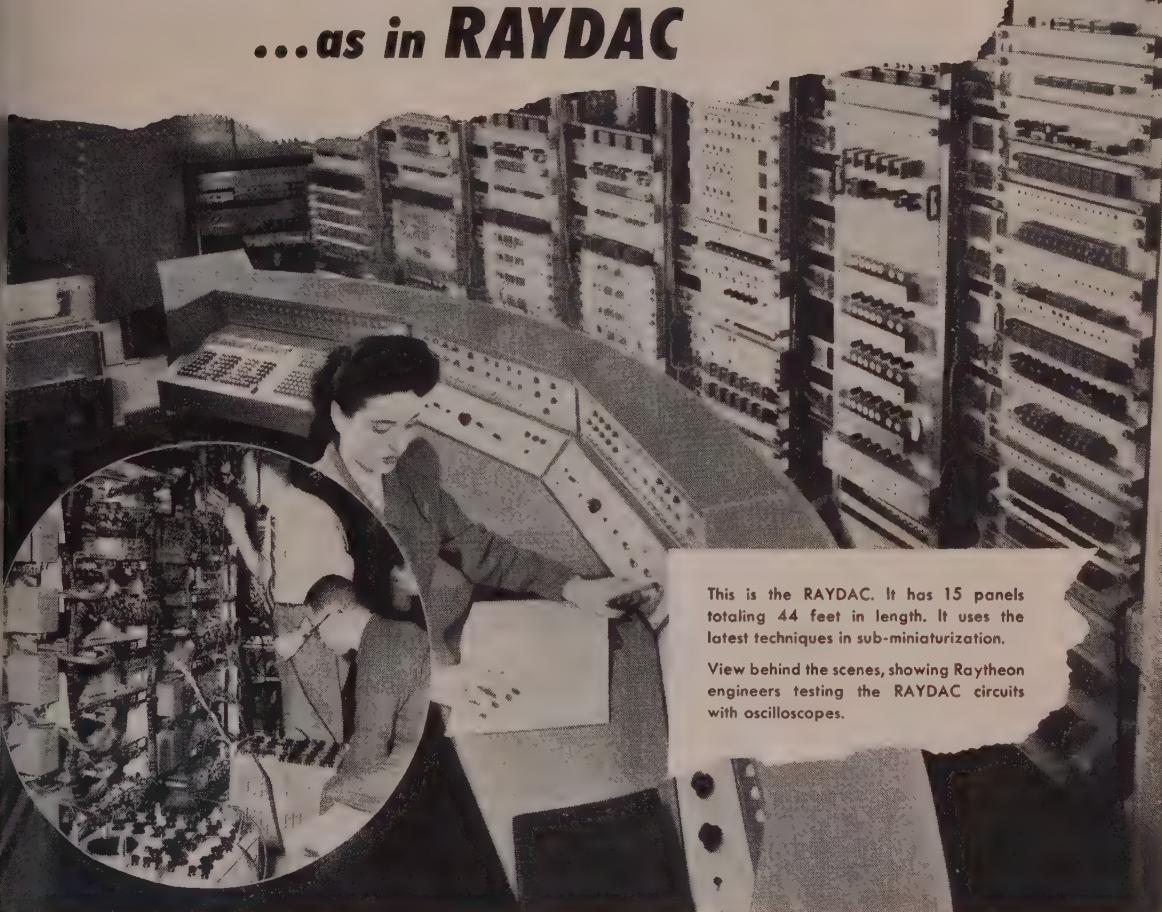
flame holders, furnace mufflers and heat treating equipment.

Today the modern high temperature ceramic coating plant is prepared to extend production to industry. Facilities at Bettinger, for instance, make it possible to apply any type of ceramic coating to virtually any metal alloy requiring protection. An experimental and development laboratory is available to manufacturers for testing application of the ceramic coating for new and specialized uses.

Cleaning Bottleneck—Perhaps the greatest bottleneck in the early stages of development was the preparation of the metal itself before application of the coating. Early General Electric Co. experiments on metal preparation showed that sandblasting had to be combined with complicated pickling before high temperature ceramic coatings would adhere satisfactorily to metals. Each part must go through various acids and rinses many times, alternated with cold water pressure rinses. We must absolutely clean, low-pressure sand-

By FRED D. SHAW
Vice President
Bettinger Corp.
Waltham, Mass.

Collaborate with Revere for Reliability ...as in RAYDAC



This is the RAYDAC. It has 15 panels totaling 44 feet in length. It uses the latest techniques in sub-miniaturization.

View behind the scenes, showing Raytheon engineers testing the RAYDAC circuits with oscilloscopes.

RAYDAC means Raytheon Digital Automatic Computer, developed by the Raytheon Manufacturing Company, Waltham, Mass., for the Navy's Bureau of Aeronautics. It is an "intelligence center" to help analyze the behavior of missiles during test flights. Its importance is indicated by the fact that in a matter of minutes it can perform the calculations involved in analyzing a single missile flight, a task that would take a team of mathematicians from 20 to 30 days. The RAYDAC thus speeds up tremendously the development and testing of such missiles. It contains enough tubes and germanium diodes made by Raytheon, for more than 1,000 home radio sets.

In such a complicated electronic computer reliability is essential. This is achieved through design, the choice of the best materials and components, and meticulous manufacture. Revere during the past 10 years has collaborated closely with Raytheon, working out proper specifications for materials, as for example, OFHC copper. Raytheon engineers and production men have visited Revere laboratories at New Bedford,

Mass., and Rome, N. Y., and many Revere specialists have studied methods and processes in the Raytheon plants and laboratories. These hand-in-glove contacts, many of them highly confidential, have proved their value.

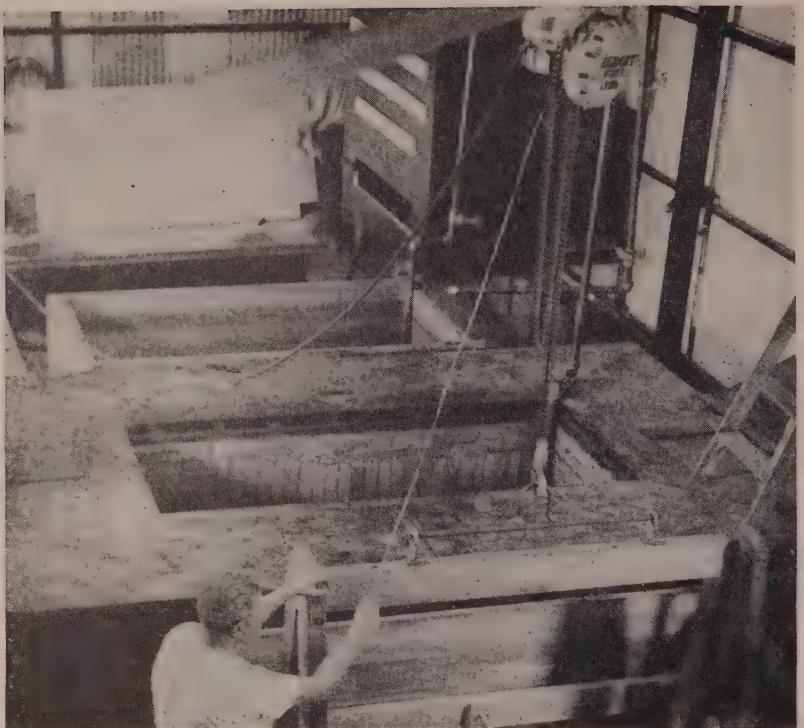
The same kind of collaboration is open to you, and will be especially useful and time-saving if begun as soon as you have a new project on your boards. To obtain it, simply get in touch with the nearest Revere Sales Office. See your telephone book or write direct.

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Tanks built for high temperature pickling process at Bettinger. Alternate acid dips and cold water sprays remove scale before final blast cleaning

blasting renders the smoothest possible surface.

Because the conventional pickling equipment is useless for the necessarily high-volatile acids, special carbon brick tanks have been constructed to hold the concentrated nitric and hydrofluoric acids in hot solution for the initial cleaning. Cypress wood is used for flues, shrouds and rinse tanks to be sure that there is no metal for the acid fumes to attack. Special drying and rotating draining systems were also devised and built.

Selecting the Coating — Three points must be considered in the choice of proper coating material. First, the degree of protection needed in terms of operating temperature, operational stress, strength and life expectancy of the part. Second, the type of metal to be coated; and third, the conditions of operation defined by heating cycle or motion of the part.

In the matter of the second point, for example, coatings on low-carbon steels must be fused early in the heating cycle to seal off oxygen and prevent too much oxidation of metal. For firing very high alloy metals, fusion has to be delayed until sufficient metal oxide

is formed to guarantee adhesion.

Experimental development has proved that two general classes of ceramic coatings are most suitable for common use. One of these is the Solaramic and A-418 series, used for coating 300-400 series stainless steels as well as the higher nickel alloys such as Inconel. Other class is the A-19 series used for coating lower grade alloys.

Composition and Consistency — High temperature ceramic coatings are usually only a 0.001-inch thickness of refractory ingredients fused (at 1875° F) to the surface of the part to be protected. Material itself is a mixture of frit (small pieces of glass), clay, high temperature metal oxides and other substances. Composition and consistency varies according to special requirements, and both must be carefully controlled.

The capacities of these coatings have been discovered through controlled performance tests, specimen tests and experimental applications in extensive laboratory work. Test pieces have been heated rapidly from below freezing to 1875° F and plunged into cold water again and again to prove thermal shock resistance. Ability of coatings to

take blade growth at high temperatures has been indicated by repeated trials with ceramic coated blades.

Gage Can Vary — Greatest problem of all is that in many parts (such as a turbo-supercharger nozzle box) there are several types of bases for the same ceramic coat—some heavy gage metal, some light gage metal, some coated and some welded areas. When fired, the thin sections heat up and cool quickly than the thick sections, causing castings at a different rate than sheet metal.

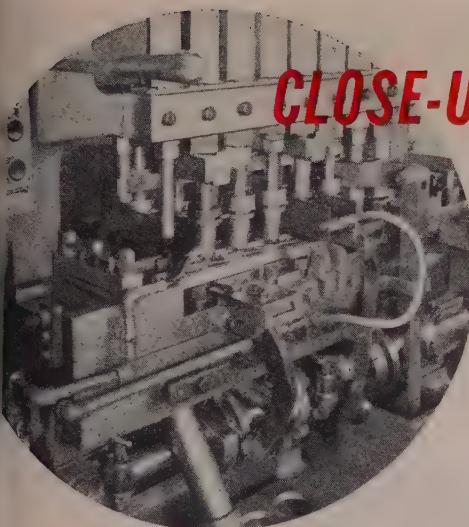
Metal preparation and the firing of the coating on such a piece may be very exacting. To insure a smooth, flat, uniform surface, the base must be uniform in finish that the coating will fuse equally well on all sections of the piece is the major problem in this type of process.

Time Is Consistent — Processing time for high alloy steel parts in the new mass production system has proved to be well in line with the pace of other large-scale modern production techniques. While the time may vary, parts which enter the plant for coating go through a standardized production route which includes scaling, pickling, firing of coating and overall final inspection.

During the processing, continuous inspection of parts and of coating composition is based on visual standards and experience gained during experimental development. Parts are subjected to repeated spot checking for thermal and mechanical shock. Final inspection is done with gages and instruments. If any part is unsatisfactory, it can be reworked by stripping the coating and reprocessing. Only rework is allowed, however, since recycling might harm the base.

Field Repairs? — There is no indication that ceramic coatings can be repaired in the field. This would apply, of course, only to small spots with signs of wear and damage. In the near future, it is anticipated that it will be possible to clean a part locally and apply a healing coating by spraying or torch firing.

Each day new possibilities are suggested and new uses of the process will continue to be developed for industry.



CLOSE-UP

*of versatile
mass-production ability*

Waterbury Farrel EYELET MACHINES

Close-up of an 8-plunger WF cam eyelet machine showing tools and special attachments. Included are a lever type blank holder, a scrap box and a compressed air blower and oscillating shutter, dovetailed blank holders and a hook type side stabber.

WF Multiple Plunger Presses Are Built For Long-Lived Automatic Production Of A Wide Range Of Products

Known throughout the world for profit-making, high efficiency, low maintenance performance.

Cam type is available in seven sizes . . . 6 to 12 plungers . . . cam strokes ranging from $1\frac{1}{4}$ " to 6" . . . blank diameters up to $4\frac{1}{2}$ ".

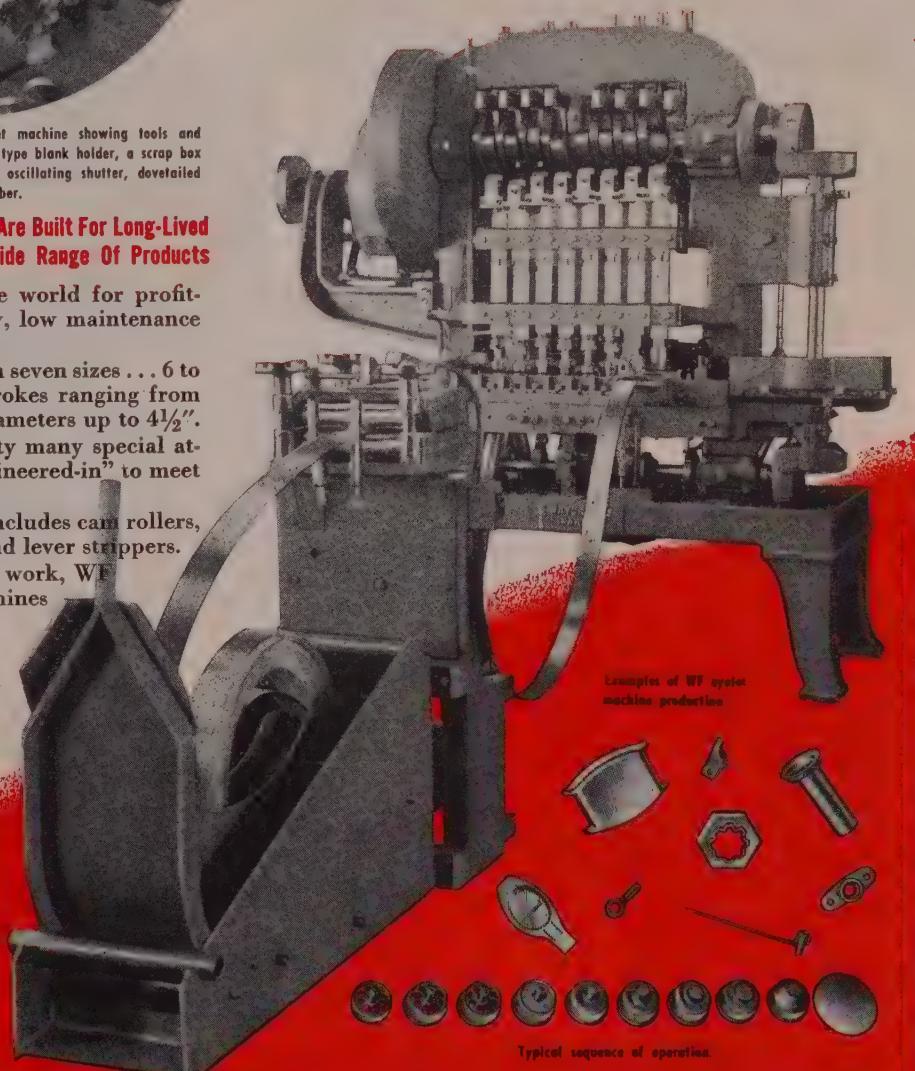
For increased versatility many special attachments can be "engineered-in" to meet specific needs.

Improved WF design includes cam rollers, friction clutch drive and lever strippers.

For a heavier range of work, WF crank type eyelet machines are available in five standard sizes.

Write today for complete free information on cam or crank eyelet machines or on any of the WF equipment listed below.

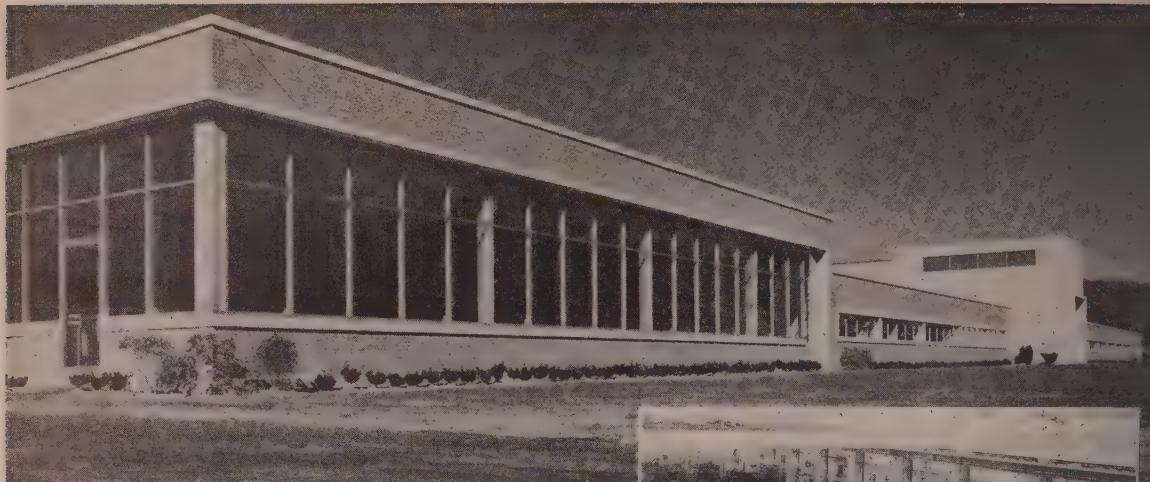
Fig. 11. WF production unit includes coil bin and straightener feeding into an 8-plunger cam eyelet machine.



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Cafeteria in foreground seats 386 people at one sitting. Entrance is at center of plant. At right, craneways are supported independently

Machine Tool Plant Features Inline Production Layout

Organized flow of parts in process will cut handling distances by 50 to 90 per cent. Ease of maintenance is another factor



NEW PLANT for the production of machine tools is now going full tilt at Norton Co. in Worcester, Mass.

Built to meet the demands of the present defense effort, the building consists of a 740 x 300-foot factory joining a 360 x 100-foot office building. Features include straightline production methods, new modern machine tools, special materials handling equipment, air-recirculating dust control equipment and forced ventilation providing three complete air changes per hour. Cost of the plant was \$6 million. Estimated top output is 150 machines per month.

Capacity Boost—Factory is of single-story construction providing 275,000 square feet of working space. It adds about 50 per cent to the company's machine-tool manufacturing capacity.

Supplies and raw stock come in at one end of the plant and progress through the five 60-foot bays toward the final assembly floor and

shipping area. Typical examples of the savings in handling are:

Travel cut from 3140 to 554 feet for a heavy grinding machine wheel slide and from 4900 to 896 feet for wheel spindles. It is estimated that over-all handling distances have been reduced 50 to 90 per cent.

Better Delivery—Straightline production simplifies the problem of quality control and expediting. As a result of more efficient methods, delivery dates may be substantially shortened.

Much of the materials handling formerly done by electric trucks is now done by floor-operated cranes supported on craneways independent of the building.

There are several receiving and shipping platforms accessible to motor trucks.

Housekeeper's Dream—Construction of the building shows that planners had efficient upkeep in mind. Practically no painting will be required to preserve the outside

surfaces. Walls are cinder block faced with brick. Aluminum window sash, galvanized steel exposed metal parts and Transite siding make up remainder of the exposed siding. The roof is of tar and gravel.

Inside construction is likewise designed for a minimum of upkeep. Office spaces are equipped with acoustic ceilings and are air conditioned throughout.

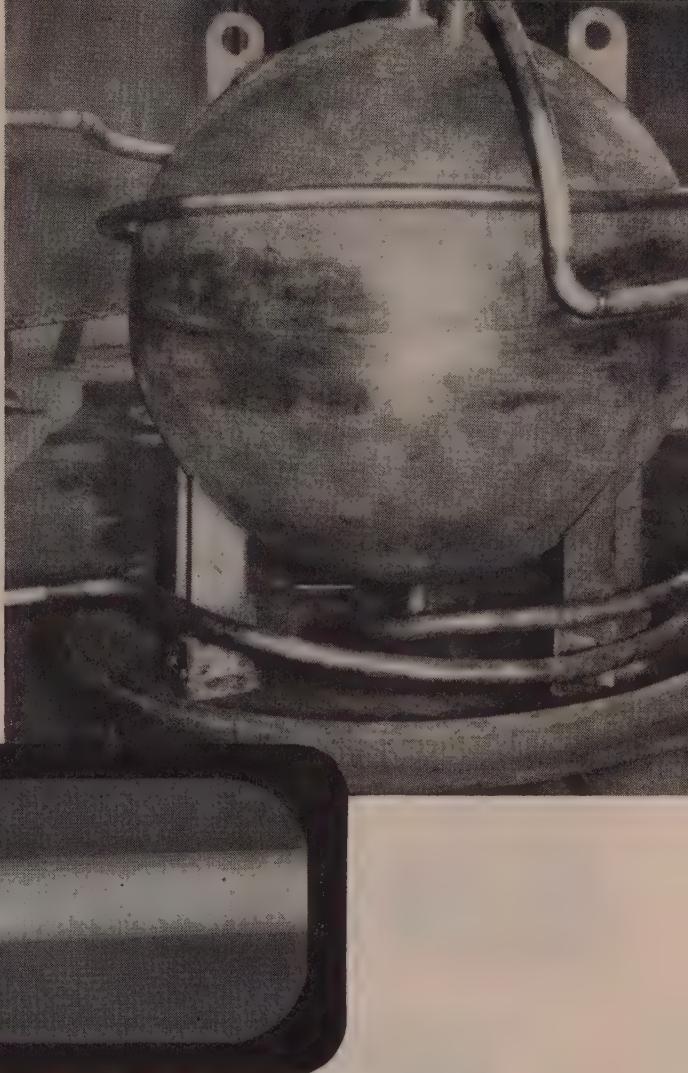
Locker rooms, washrooms, power substation and miscellaneous spaces such as stores, classrooms, and a foremen's club room are housed on a 15,000-square foot mezzanine.

Power consumption approximates 2000 kw per hour. All steam, electricity, and telephone service supplied from the main plant about a half mile away. Current employment in the grinding machine division is about 1500, 400 more than were employed prior to the expansion.

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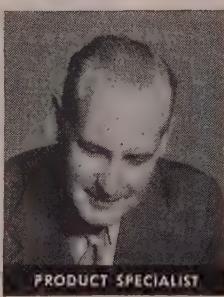
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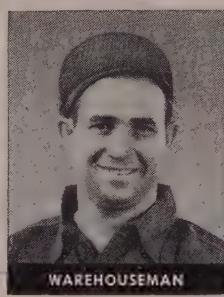
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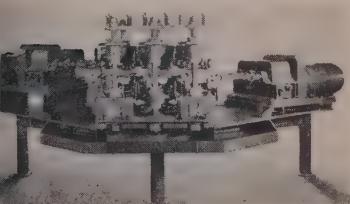
PRODUCTS and equipment

Reply card on page 121 will bring you more information on any new products and equipment in this issue

Improved Rotary Straightener

. . . has steel table mount

Improvements in this model AX tube and pipe rotary straightener include its two 3-hp motors and the five spindles on a steel table mount. While bolt holes in table facilitate permanent installation on production lines, the complete unit can be relocated quickly as production requirements affect shop layouts. A circulating flood lubrication system for the straightener's six driven rolls is now an integral part of the machine design. Petroleum-base liquid lubricant directed at points where tube or pipe contact each pair of rolls, this dissolves the residue of solutions used in drawing operations.



ashes away metal particles that might mar tube surface and lengthens roll life. As a safety measure, covers are provided for the six drive spindles. Mackintosh-Hempill Co., Dept. ST, 901 Bingham St., Pittsburgh 3, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

High-Speed Fastener

. . . driven without a dolly

This fastener makes blind spots easy to handle, can be driven without a dolly at a rate up to 1200 per hour. Called the Pop rivet, it is available in Monel and aluminum. Deep drawn from strip stock, the

rivets can be used to fasten most commercially available metals and alloys.

It consists of the rivet itself, and an inserted mandrel of high

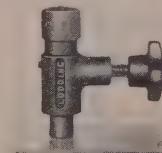


strength steel. The mandrel with attached rivet, is slipped into either predrilled holes in the work to be fastened or into the fastening tool, then into the hole. Fastening tools can be operated manually or pneumatically. J. C. Rhodes & Co., Dept. ST, New Bedford, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

All-Purpose Spring Jack

. . . no need for specials



This standard spring jack is built as a versatile work support for materials or parts being machined.

Usable in many ways, it makes design of special jacks for many jobs unnecessary. To operate, the spring-actuated plunger contacts the work without requiring manual pressure. After contact, the plunger is locked by the hand-operated screw.

A dust cap protects working

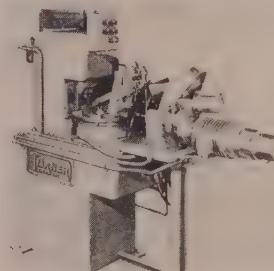
mechanism against chips and dust. All parts are rustproofed. Unit is offered in two models, one with a button base, the other with a flange. Lodging Inc., Dept. ST, 79 Beacon St., Worcester 1, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Drilling, Assembling Machine

. . . automatic hopper loading

This machine is designed for automatic drilling, assembling and crimping operations. It is built for automatic hopper loading of breather nut, insertion of baffle, crimping of baffle, drilling of nut and automatic ejection. In addition to manpower savings through automatic



operation, the unit is engineered to economize on floor space. Turner Bros. Inc., Dept. ST, 2625 Hilton Rd., Ferndale, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Steel Framing Material

. . . no nailing, drilling, welding

Three basic units — channel frames, spring-T-bolts and lock fittings—comprise the parts of this steel framing setup. Called Multi-A-Frame, the material can be used to build equipment for present needs, but can be dismantled, adapted or converted without scrapping. Frames are assembled for

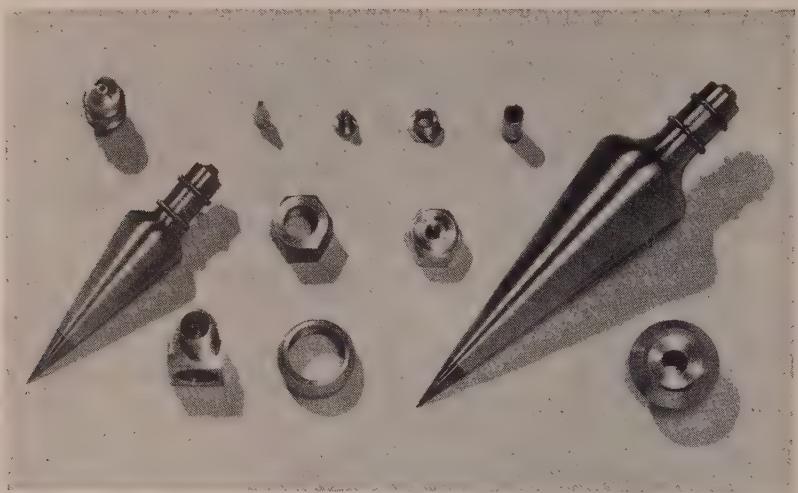


BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

BRASS
Bridgeport
co.

MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



High quality screw machine items made from free cutting brass rod. Courtesy Hershey Metal Products Inc., Derby, Conn.

Brass for Higher Quality Screw Machine Items

In periods of metal shortages there is often a switch to substitute materials. Yet, it must be remembered that brass, an alloy of copper and zinc in various proportions, has attained its position as first choice for screw machine items and countless other products because of its exceptionally fine properties and easy workability.

Brass, although an ancient metal, is also most modern because it continues to be used in the newest products of each age. Its enduring qualities are illustrated by the exquisite brass articles which are still in excellent preservation although made several thousand years ago. For example, Etruscan brasses made about 600 B.C. and the brasses found in religious structures in England, some of which date back to the 13th century, are practically as good as when originally wrought.

The brasses are the most valuable and widely employed of all non-ferrous alloys. Their high resistance to ordinary corrosive agents and the broad

range of properties which are imparted to them by variations in the proportion of the constituents and in mechanical and heat treatments give them the very versatility which fits into every type of product and industry.

Brass is easily worked, drawn, formed and machined. In spite of its great strength and resistance to wear and abrasion, it is gentle with cutting and drawing tools made from steel.

Many Alloys Available

The addition of lead to brass greatly increases its cutting speed. Bridgeport Ledrite rod No. 6 contains about 61% copper, 3.4% lead and the remainder zinc. Its machinability rating is 100%. This alloy will take care of about 90 percent of requirements for free cutting brass rod. Its high machinability rating is appreciated when a large percentage of metal must be quickly removed on an automatic screw machine as exemplified by the plumb bobs shown in the illustration.

Free cutting brass rod is generally

specified where great accuracy and close manufacturing tolerances are called for. Excellent machinability, low tool wear, and uniformity of production are also essential when it is necessary to mass produce screw machine parts with thin walls or when tiny holes and sharp threads are specified.

Where deep knurls are required and the standard Ledrite alloy No. 6 is not entirely suitable, the same alloy can be furnished in a softer temper which will permit deeper impressions to be rolled in. This can also be accomplished by using Ledrite No. 2, which is more ductile. It analyzes approximately 63% copper, 1.8% lead and remainder zinc. When a rich bronze color is required to match cast bronze, leaded commercial bronze 89 should be used. It contains about 89.5% copper, 2% lead and remainder zinc and has a machinability rating of 80 percent.

To resist salt water corrosion naval brass No. 24 is widely used. This contains approximately 60% copper, 0.65% tin, and remainder zinc. Its machinability rating is 30 percent as compared to Ledrite No. 6. However, where higher machinability rating is required, naval brass is furnished with as low as 0.6% lead (machinability rating 50 percent) or as high as 1.75% lead (machinability rating 70 percent).

Manufacturers of screw machine products should avail themselves of Bridgeport laboratory service in regard to selecting the proper alloy and temper when confronted with a new or special job for which the regular free cutting brass rod alloy is not satisfactory. The laboratory is also in a position to recommend other alloys such as silicon bronze and silicon-aluminum bronze for parts required to meet high physical properties for engineering applications or for resistance to excessive corrosion. Contact the nearest Bridgeport district office for any service which we can render on your metal problems.

(8493)



BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

CONTINUED

APRIL, 1953

USES OF CORROSION

This article is one of a series of discussions by L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.

Copper-Zinc Alloys vs. Sodium Hydroxide Solutions Containing Chlorine

Sodium hydroxide containing dissolved chlorine gas behaves markedly different from pure sodium hydroxide solution or sodium hydroxide solutions with hydrogen sulfide. Chlorine dissolved in sodium hydroxide forms sodium hypochlorite and is commercially called chlorinated soda solution bleach. Commercial bleach contains about 5% sodium hypochlorite, 4% Cl and 1.0% sodium hydroxide (or carbonate) and is also used as a disinfectant for dairy and drinking utensils, swimming pools, animal quarters, etc. The curve for maximum rate of corrosion based on loss in tensile strength at the water line for copper-zinc alloys shows that the corrosion rate decreases somewhat from 100 to 85% copper and then rapidly increases up to 70% copper and finally drops back to a lower rate of corrosion at 65-60% copper. The rates of corrosion for the submerged portions below the water line are 1/5 to 1/20 the rates obtained at the water line.

Data for copper-silicon, copper-tin alloys and modified brasses are also given. Those alloys above the copper-zinc alloy curve show decreased corrosion resistance and those below, increased corrosion resistance. In contrast with the effect of hydrogen sulfide (discussed in the two previous issues of the Copper Alloy Bulletin) in sodium hydroxide solution, the chlorine markedly increased the rate of corrosion of the copper-tin and copper-silicon alloys due to the solubility and unstable character of the corrosion products on the alloy surface.

The addition of 3/4% tin to 60 Cu, 40 Zn alloy slightly increased the corrosion resistance. The addition of 3/4% tin and 0.1% arsenic to 60 Cu, 40 Zn further increased the corrosion resistance. The most corrosion-resistant alloy is brass rod containing 3.4% lead. Under these conditions the lead-bearing corrosion products formed on the brass offered considerable protection to the underlying metal. This high-leaded brass alloy has proven more satisfactory than steel, stainless steel, nickel-copper alloys, aluminum, etc., for valves handling sodium hypochlorite solutions used in washing and sterilizing equipment.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Semi-Automatic Coil Bender is said to be suitable for production line needs in serpentine coil bending. Equipped with single control lever, stationary bending form, rotation wiping shoe and semi-circular table to keep long coils in horizontal position during sweep of bending cycle. Averages 450 bends per hour. **No. 1291**

Quick-Change Soldering Iron Element features easily removed terminal block. Finger pressure on terminal guard is said to release terminal instantaneously. Element lead wires do not have to be fished around terminal. A steel spring guard reinforces terminal, preventing breakage. Brass sheath on element prevents damage to resistance wire and mica during replacement. **No. 1292**

Internal Diameter Groove Gage has long slender shank for insertion into deep bores. Uniform pressure to tips is said to eliminate operator "feel." Tips expand when trigger is released to give instant dial readings. Tips are thin enough to gage "O" Ring and Snap Ring Grooves. Gage is accurate to .0001 in. **No. 1293**

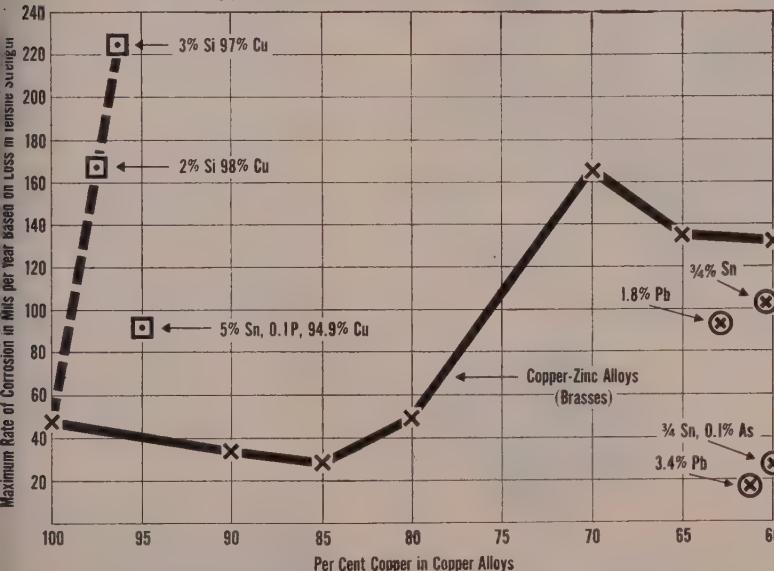
Scrap Bundling Machine for wire or strip forms compact cylinders around a revolving spindle. Available in two models to form rolls 18 in. in diameter and 18 in. long, and 24 x 24, machine transmits power to spindle by a sprocket and roller chain drive. Air pressure system is utilized to discharge bundled scrap. **No. 1294**

Dial Tape Dispenser, electrically operated, is reported to save 20% in time and gummed tape. Dialed with finger tip, dispenser selects tape length from 3 to 39 inches; lengths from 39 to 78 inches by two successive dialings. Handles paper, cloth or filament-inserted tape in sizes 1 to 3 inches wide; rolls to 9 in. diameter. **No. 1295**

Hand Torch for brazing, glass working, light welding, soldering and electrical work burns natural gas, butane or propane with compressed air or oxygen (hydrogen where needed). Has grip control for automatic gas cutoff and five interchangeable flame units. Torch weighs 12 oz. **No. 1296**

Non-Slip Work Gloves coated with vinyl resins are said to resist acids, alkalies, oils, lubricants and most chemicals. They are highly abrasion-resistant and remain flexible at low temperatures. Available in fully coated or palm coated types in many styles. **No. 1297**

RATE OF WATER LINE CORROSION OF COPPER ALLOYS IN 1.0 N SODIUM HYDROXIDE SOLUTION SATURATED WITH CHLORINE AT ROOM TEMPERATURE. 79 DAY TEST. SOLUTION CHANGED EVERY FOUR DAYS.



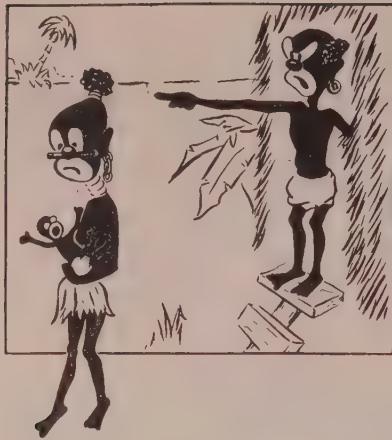
BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL

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NEW PRODUCTS
 and equipment

material handling, production or maintenance without nailing, drilling or welding.

Standard lengths can be cut and



assembled with a common wrench, or the frame can be engineered and cut to individual specifications. Ainsworth Mfg. Corp., Dept. ST, 2200 Franklin St., Detroit 7, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Thermocouple Tube

... halves nickel requirements

Thermocouple - protecting tube made of nickel alloy uses about half as much nickel as previous models. Tubes are made of Incoloy, an alloy that has similar physical properties to Inconel. Industrial Division, Minneapolis-Honeywell Regulator Co., Dept. ST, Wayne & Windrim Aves., Philadelphia 44, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Improved Refractory Gun

... loading made easier, faster

Redesigned model PM-1 Blastcrete gun provides easier, faster loading, better control of material flow and air pressure to meet ASME code for pressure vessels. Slide valve in the loading chamber provides improved loading. Feed

Threadwell

**USE A
 REPLY CARD**

Just circle the corresponding number of any item in this section for more information.

Yours

FOR THE ASKING

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Large Compressors

open-Bessemer Corp.—Type M
water driven compressors range in
from 300 to 1000 hp and are de-
signed for 80 to 110 psi discharge
pressure. Information regarding de-
sign and performance of these ma-
chines, as well as typical installation
situations are contained in 4-page illus-
trated bulletin M-65 A.

Tube Mill Machinery

Henry A. Spittler—Illustrated and
described in 4-page bulletin "Pre-
cision Tube Mill Machinery" are
automatic tube benders, tube or
straighteners, tube cutters and
headers, hammer tube swagers, tube
on bench and other machines.

Speed Reducers

Bridge Mfg. Co.—A complete line
of shaft-mounted speed reducers with
output speeds from 12 to 330 rpm
and capacities from 1 to 43 hp is
offered in 20-page illustrated bulle-
tin A-614-A. All data necessary for
correct selection of proper drive unit
is included. Also covered is Tri-
tastic overload release for use with
the Torque-Arm reducers.

Plating Solutions

Allied Chemical & Dye Corp., Gen-
eral Chemical Div.—"The Modern
Way to Electroplate Efficiently, Eco-
nomically" is title of 20-page illus-
trated guide to the use of metal
borate solutions in plating lead,
tin, iron, copper, nickel, cadmium and
zinc.

Shovel-Crane

Link-Belt Speeder Corp.—24-page
illustrated catalog No. 2428 covers
complete line of $\frac{1}{2}$ -yd shovel-cranes,
including crawler, truck and wheel-
mounted models. Specifications, op-
eration and features are detailed.

Fastening Techniques

Milford Rivet & Machine Co.—"The
Milford Method" is a 12-page bro-
chure which deals with a scientific

approach to products and parts as-
sembly. It describes an integrated
service of fastener research, design,
application engineering and production
collaboration which is offered by
this company. A copy is yours for
the asking.

75. Tap Data

Threadwell Tap & Die Co.—
Pocket-size 56-page illustrated "Tap
Manual" contains much data on taps,
including basic information, sharpening,
formulas, ordering, lubrication,
speeds, tolerances, etc., etc. Many
drawings are used in this "textbook."



76. Vibration Control

Felters Co.—"Why It Pays to
Anchor Your Machines with Uni-
sorb" is 20-page illustrated booklet
on machine anchoring material which
controls transmitted vibration and
noise. Covered are installation, ma-
terials, system's advantages and ap-
plication to various machines, includ-
ing lathes.

77. Spintesting Units

Warren Brothers Roads Co., Mfg.
Div.—Vacuum high speed testing
unit for testing rotating parts at
speeds up to and exceeding 100,000
rpm is subject of descriptive 4-page
bulletin. Parts commonly tested are
fan impellers, turbine and compres-
sor rotors, accessory turbines and
gyros.

78. V-Link Belting

Brammer Corp.—Sizes and prices;
advantages of V-link belts compared
with endless V-belts; Brammer V-
link vs. other detachable V-link belting;
selection table with power cor-
rection factors; and assembly, in-
stallation and maintenance instruc-
tions are included in data book 205.

4-13-53

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3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
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4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

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79. V-Belt Drives & Sheaves

Pyott Foundry & Machine Co.—Containing revised data, 56-page catalog and reference book V-1000 provides all the necessary information required for specifying Pyott drives, Vee-Tex belts and sheaves. Drives from 1 to 1000 hp are specified, and drive and center ratios, sheave dimensions and belt speeds are fully tabulated.

80. Building Maintenance

Stonhard Co.—With 48 pages and lots of pictures, manual entitled "Over the Rough Spots" gives practical information on how to patch or resurface any type of floor, stop seepage, repair leaky roofs, preserve concrete or wood surfaces, protect structural steel, etc.

81. Push-Pull Controls

Simmonds Aeroessories, Inc. — Pictures, drawings and tables are utilized in 12-page illustrated manual on Simmonds push-pull controls to show how light and standard duty units in rigid or flexible housings can be employed in all types of equipment and machines.

82. Oil & Gas Burners

Coen Co.—Pac-O-Matic oil, gas and combination oil and gas burners available in 15 sizes from 50 to 900 hp, with various supply pressures and grades of fuel oil are described and illustrated in 8-page bulletin P-152. Units are packaged and pre-assembled for easy installation.

83. Precision Control Systems

Transicoil Corp.—Photographs and diagrams of precision automatic control components are found in 12-page bulletin MC1. Described are basic control motors, motor driven induction generators, miniature gear trains, servo amplifiers and combination units.

84. Texturized Metal

Rigidized Metals Corp.—Just how Rigid-Tex ferrous or nonferrous, solid or perforated, embossed and rigidized metals can be fabricated in same manner as plain sheets is explained in 6-page illustrated folder DR-852. Material can be bent, welded, soldered, riveted, formed, stamped, drawn or lock-seamed.

85. Wire Rope Data

Macwhyte Co.—If there's anything you want to know about wire rope, you'll find it in the 174-page pocket-size catalog G-15 offered to buyers

and users of this versatile material. Technical information supplements the complete descriptions and specification tables to present a useful manual on the selection and application of wire rope and accessories.

86. Centrifugal Pumps

Ingersoll-Rand Co.—16-page bulletin 7223 on general-purpose centrifugal pumps of cradle-mounted type covers five basic cradle groups and 17 corresponding pump types, their capacities, horsepower ratings and uses. Two pages on pump dimensions and a table of performance under 60 cycle use are included.



EDITORIAL REPRINTS:

87. Use of Magnesium

Consumption of magnesium promises to rise at a rate unmatched by other metals in years to come, according to STEEL reprint "Magnesium's Sights Set High" by A. C. Winston of Dow Chemical Co. Currently, emphasis is on weight saving in military applications, but long range growth depends on additional civilian uses. New facilities provide a growth cushion.

88. Contouring

"Contouring Takes on the Heavy Weights" is STEEL reprint by P. J. Gibbin, Kennametal Inc. engineer which describes how improved contouring methods and carbide cutters are paying dividends in the heavy metal removal field.

89. The Blast Furnace

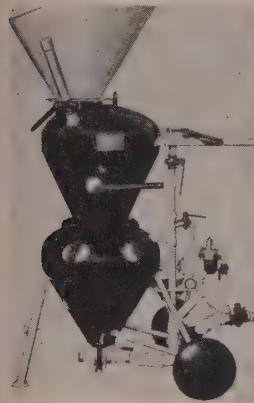
In Part III of C. E. Agnew's STEEL article, "Don't Write Off the Blast Furnace" the author questions the use of oxygen-enriched blast to correct a hanging or bridging furnace. He also shows how introduction of carbon monoxide with blast can be detrimental to furnace operation and economy. Reprint of this article now available.

90. Titanium & Zirconium

Titanium and zirconium, as metals of the future, vied with steel for interest at ASM session of the Western Metal Congress held in Los Angeles. Molybdenum and boron steel also received consideration. Highlights of papers presented are reported in STEEL reprint "New, Old Metals Share Advances."

control makes it possible to adjust material flow to any desired amount or to cut off material constantly when free air is desired. Pressure can be controlled to any desired degree.

The gun handles material up to 100 per cent moisture, eliminating



the need for protection against normal atmospheric moisture. It ace 1 to 5 cubic yards per hour, handling all cementitious materials for construction and all refractory materials as well as many lightweight aggregates. Blastercrete Equipment Co. Inc., Dept. ST, 1154 Santa Monica Blvd., Los Angeles 25, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Induction Heating Detector

... direct temperature gage


Direct temperature measurement of visible work heated by most high frequency induction units, where speed of response must be fast and available target area is extremely small, is produced by this 8891-C Rayotube. Combined with a recorder or controller, the detector provides full

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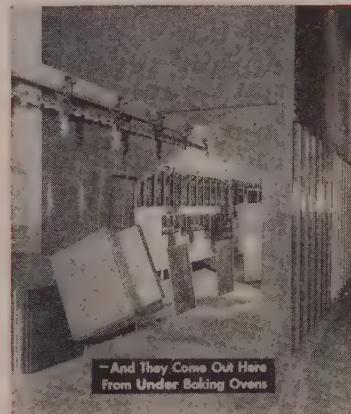
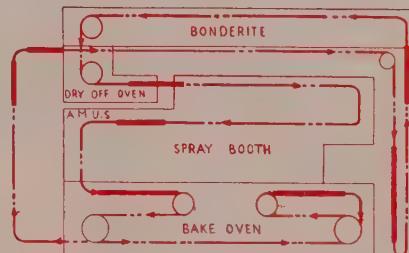


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**Making the
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A manufacturer of office furniture had a problem. He wanted a complete finishing unit in his plant—from Bonderizing • to Drying Ovens • to Spray Booths • to Baking Ovens • **BUT he didn't have much space.** Peters-Dalton Engineers studied his plant—made the layout shown above—sent his products through a system that **doubled** his floor space. Overhead installations were laid out and made of the Air-Makeup System and Baking Ovens. The finishing line was sent **around, over and under.** Result: A compact finishing system, efficient to the Nth degree—yet utilizing plant cubic footage where before only square footage seemed available. **Write For Catalog.**

P Hydro-Whirl Paint Spray Booths **P** Industrial Washing Equipment

P Drying and Baking Ovens **P** Hydro-Whirl Dust Collecting Systems



Peters-Dalton INC.

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YOU *Can* AVOID DIE COSTS COMPLETELY

On Your Next
STAMPING ORDER



Yes, you can — but it's not necessarily the best thing for you.

You want the lowest unit cost — for the life of the part, including re-runs. It may well be that our **Machine-Cut Method**, with no die cost, does work out best.

Or, it might better be our **Short Run Method**, using economical blanking dies and stock punches.

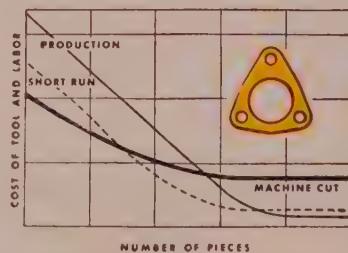
Sometimes, even with very short runs, it pays to use our **Production Method** with a standard die or our own surprisingly inexpensive Hecht-type tool.

In any case, the decision is a technical one based on many factors, not just length of run. You save money when the correct decision is made.

WE USE ALL THREE METHODS — LET US MAKE AN IMPARTIAL DECISION FOR YOU

For example, take the part illustrated. From 1-65 parts, our **Machine-Cut Method** is most economical. At 65 parts, the **Short-Run Method** is best until, at 7,000 units, the standard **Production Method** is most satisfactory.

These breaking points as charted vary drastically with every stamping, but the general principle remains the same.



Manufacturers of ALL TYPES OF SHIMS

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STAMPINGS DIVISION, LAMINATED SHIM COMPANY
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Gentlemen:

Please rush me my free copy of "SERVICE IN STAMPINGS"—the 12-page, illustrated booklet full of helpful facts on the economical buying of stampings.

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control of induction heating directly from work temperature.

Quick-sighting, double-mirror optical system permits sighting through a small opening to find desired target easily. All radiation from infrared to ultraviolet is focused at the same point. Thus radiation outside the target area does not reach the highly sensitive thermopile. It can't be damaged by vibrations and operation is safe at ambient temperatures as high as 350° F. Leeds & Northrup Co., Dept. ST, 4901 Stenton Ave., Philadelphia 44, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Drill Extension Chucks

. . . fit without brazing

Drill extension rod and chuck fit over small diameter drills with out time-consuming brazing or soldering. The extension units are designed to reduce the need for special length drills in hard-to-reach locations.

The 52 small diameter extension chucks fit one threaded drill exten-



sion rod and can be interchanged in seconds. Chuck sizes correspond to standard drill sizes. Beaver Tool Co., Dept. ST, Box 298, Huntington, Long Island, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Metal Surface Cleaner

. . . works at room temperature

Solid cold metal cleaner, made for room temperature operation, is a powdered-to-granulated material with free-flowing characteristics. The solid component used in conjunction with the manufacturer's liquid emulsion is a buffered system with absence of free caustic. It is capable of ready solution and dispersion in water.

By cleaning at room temperature, steam and attendant maintenance are eliminated. In addition



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MILL**

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RESPONSIBILITY**

4-HIGH HOT STRIP MILL, DETROIT STEEL
CORPORATION, PORTSMOUTH, OHIO

Designers and Builders—
Pittsburgh Engineering and Machine Company

We specialize in the complete design and installation of modern mill machinery that will work harder with less maintenance resulting in greater economy of operation. Our facilities include engineering and manufacturing from Blueprint to Operation with undivided responsibility.

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**ENGINEERING
& MACHINE CO.**

319 Farmer's Bank Bldg., Pittsburgh 22, Pa. • Plant at Glassport, Pa.

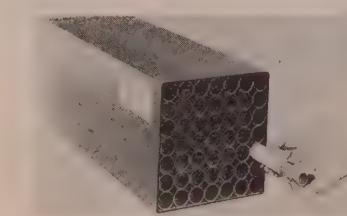
its action is reported to inhibit corrosion on cleaned surfaces. It prepares metal surfaces for easy self-draining and rinsing, exhibiting low or nonfoaming behavior even with high agitation. Nelson Chemicals Co., Dept. ST, 12345 Schaefer Highway, Detroit 27, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Layout Tube File

... index co-ordinates material

Layouts and tracings can be filed using the mailing tube method with material made readily available by an index that relates to co-ordinated tubes in the file. Each Multi-roll file unit contains 49 individual tubes, each $1\frac{3}{4}$ -inch ID. These are



encased in a corrugated board container, secured to produce a unitized assembly of 200-pound test strength.

Contents of each tube compartment can be recorded on the index form furnished with the file. When alphabetical, topical or cross-referenced indexing is indicated, contents can be entered in a card file system. Three models provide tube lengths of 30, 42 and 54 inches. Roll & File Systems Inc., Dept. ST, Box 85, Ferndale 20, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Vise-Jaw Face Plates

... guard against marred parts



Soft and finished materials are protected from vise jaw mars by these Nava-Mar face plates. The model eliminates time wasted on makeshifts; saves products through efficient, accurate work. Plates are made in $\frac{1}{4}$ -inch sizes to fit any standard vise make up to 6 inches. Fastened by a set screw, they become an integral part

of the vise jaw, but can be removed by a quick turn of the screwdriver.

Materials employed include bronze, aluminum and fiber or babbitt facings bonded to aluminum bodies. Maroth Engineering Division, Kenimar Corp., Dept. ST, Glenville, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Combination Cable Connector

... attaches to holder

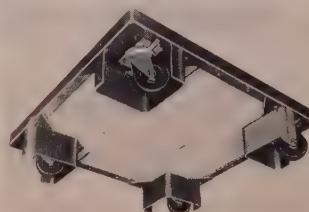
Welding cable can be attached to the Shortstub electrode holder by a screw clamping arrangement. A large contact area between the holder and cable and an extremely tight connection is made possible by use of a large $\frac{1}{2}$ -inch diameter fine thread socket screw. Bernard Welding Equipment Co., Dept. ST, 10222 Ave. N, Chicago 17, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Heavy-Duty Dolly

... truck guards protect casters

Guards to protect casters when the dolly is lifted by a fork truck are employed on this heavy-duty unit. Swivel-tightened type casters are fitted with plungers that



can be engaged to lock casters at any fixed position.

Aluminum-magnesium construction provides a lightweight unit easy to move and carry. Platform has magnesium, aluminum or hardwood surface engineered to provide required strength and rigidity. Crescent Metal Products Inc., Dept. ST, 18901 St. Clair Ave., Cleveland 10, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Silicone Ointment

... protects worker's hands

Silicote skin protective ointment protects worker's hands when they are exposed to water and other substances. It repels water and

moisture and may be used either before exposure to prevent irritation or therapeutically to facilitate healing. Arnar-Stone Laboratories Inc., Dept. ST, 1316 Sherman Ave, Evanston, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Variable Speed Drive

... ups application flexibility

Variable speed unit, called Flexi-Speed drive, can be mounted in any position around the driven equipment and can drive in any direction. It can deliver any speed within a ratio of 8 to 1. Speed control handwheel can be located parallel to or in any of eight position



perpendicular to the motor shaft. Six different length belts offer a choice of shaft center distances.

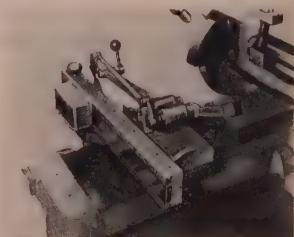
Drives are available in $\frac{1}{2}$, $\frac{3}{4}$ and 1 hp capacities. They are adaptable to essentially all industrial applications, including those with in-line or right-angle reducers, countershafts, chain and sprocket or V-belt drives. Reeves Pulley Co., Dept. ST, Columbus, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

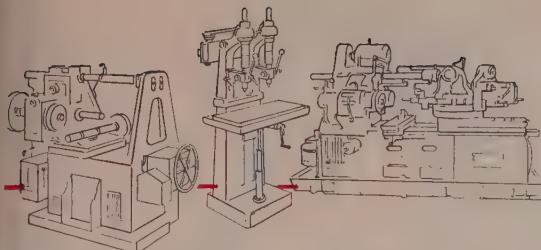
Rotary Planer Model

... mills structural, castings

This rotary planer is used for milling structural members and castings such as ingot molds. The machine can be furnished with



various cutter head diameters to suit particular requirements. Cut shows a 48-inch head that has 4-inch in and out adjustment by



**YOU DON'T ALWAYS NEED
MACHINE TOOLS
FOR FINISHED
MACHINE PARTS**

Specify **OILITE**

PRODUCTS OF SINTERED METALS

With OILITE YOU:

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- Conserve Skilled Man Hours
- Conserve Strategic Material
- Get Quick Delivery

**Other OILITE
Advantages Include:**

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AMPLEX MANUFACTURING COMPANY

Subsidiary of Chrysler Corporation

Detroit 31, Michigan

**Oilite Products include: BEARINGS, Finished Machine Parts,
Cored and Solid Bars, Permanent Filters, and Special Units.**



Weld "difficult" steels with little or no pre-heat!

use P&H LOW-HYDROGEN ELECTRODES

P&H has the industry's most complete line of low-hydrogen electrodes — many custom-built to match the chemical analysis or heat-treating properties of a variety of alloy steels. Being hydrogen-free, these electrodes eliminate underbead cracking — little or no pre-heat is needed to get high-strength welds on problem steels, steel castings, nickel-alloy steels, chrome-moly steels, .40 carbon castings, high-hardenable steels, aircraft and similar steels. There are other important advantages, too — for example, lower cost, compared to stainless-steel electrodes formerly used on many jobs. Ask your P&H representative or distributor for all the facts. Or write for bulletin 5-26.

P&H WELDING DIVISION

HARNISCHFEGER
CORPORATION

4411 W. National Ave. • Milwaukee 46, Wisconsin



Chrome-moly header, typical of high-pressure, high-temperature applications.



Low-alloy casting, typical of applications where physical properties must be matched.



Alloy gear rim, typical application matching heat-treating properties of parent metal.



Excavator body, typical of heavy sections welded with P&H Low-Hydrogen Electrodes.

the **P&H** Line



ans of handwheels arranged so adjustment can be made from either side of the carriage.

Planer is equipped with hydraulic feed for cutter head travel, operated by electrical control. Planer length is 7 feet, 6 inches with feed from 1 to 10½ inches. Head operates at 50 fpm. Cleveland Punch & Shear Works Co., Dept. 11, Cleveland 14, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Safety Tank Car Platform

... gets men off car tops

Hazards of men working on riveted tank car tops are eliminated by this safety platform. From the platform's grated deck, the operator can turn the entire platform 360 degrees, stopping at any angle



over the top of the car. When the operation permits, he can serve two cars—one on each set of tracks on either side of the platform.

The platform is properly balanced and rides on roller bearings, so is turned easily by the hand crank wheel which is geared to the supporting steel column. A foot brake holds the platform stable in stopped position. Nichols Engineering Co., Dept. ST, 3816 W. Grand Ave., Chicago, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

Truck-Mounted Flexible Shaft

... complete, easy portability

Truck mount consisting of a hand truck with wheeled rear axle and front skids, secures maximum portability for the manufacturer's flexible shaft machine. The mount is designed to counteract operators' habit of pulling the machine by the flexible shaft from point to point. The unit is mounted on the truck

deck in such a position that one operator merely presses down on the handle to lift the front skids. Handle is equipped with a fixed clamp that holds the handpiece and



tool. Thus, the equipment can be used as a fixed bench tool or a portable tool. N. A. Strand Division, Franklin Balmor Corp., Dept. ST, Baltimore 11, Md.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Ammeter Shunts

... in sizes 150 to 10,000 amp

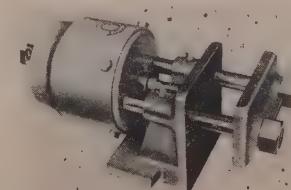
Direct current ammeter shunts designed for use with 50 millivolt meter instruments are available in sizes ranging from 150 to 10,000 amp. Units are calibrated to within ½ of 1 per cent accuracy and are complete with 10 foot calibrated leads. Rapid Electric Co., Dept. ST, 2881 Middletown Rd., Bronx 61, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 20

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... synchronizing simplified

This simple air-controlled vise can be synchronized with operations of most machine tools. Design of the RIK vise places both air cylinder and stationary jaw on



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sembly instead of next to the a cylinder, the cutting tool need not pass over the cylinder.

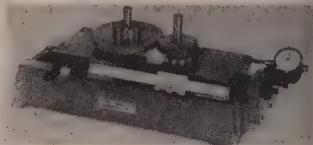
Overall length is 12 inches; jaw height, 5½ inches; and width, 4½ inches. Standard jaw opening reaches 2 inches, while a special 6-inch opening is available. Wilson Bohannan Co., Dept. ST, Marion, Ohio. FOR MORE DATA—CIRCLE REPLY CARD NO. 21

Spur Gear Tester

... gage reads in 0.0005-inch

Floating head rests on precision steel balls to provide extreme sensitivity in this spur gear tester. Head contacts a dial gage reading in 0.0005-inch. For measuring center distance, a rustproof scale and vernier is furnished reading 0.001-inch.

For quick, easy visibility, the



scale has a bright chromium finish. Slides are drilled and tapped for mounting vertical center supports for inspection of pinion gears. The gears to be tested are placed on fixed arbors or studs avoiding rotating shafts that might introduce errors. George Scher Co. Inc., Dept. ST, 200 Lafayette St., New York 12, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 22

Air-Operated Tape Dispenser

... delivers tape automatically



Speed and accuracy are characteristics of this automatic air-operated tape dispenser. Adjustable for various lengths and sizes of tape, the foot pedal control reduces dispensing time to zero and delivers at the same position in every operation. The dispenser attaches to any factory air line. Air Fixtures Inc., Dept. ST, N. Manchester, Ind.

FOR MORE DATA—CIRCLE REPLY CARD NO. 23

Dull Tools Sap Aluminum Alloy Strength

Series of tests show effect of poor cutting edges and inadequate coolant on tensile and yield strength. Overheating may carry temperature into critical range

IMPORTANCE of good practice in machining heat-treated aluminum alloys to strength and quality of finished products is re-emphasized in tests conducted by engineers at Harvey Machine Co. Inc., Torrance, Calif. Results show that serious losses in tensile and yield strengths occur from overheating when machining tools are permitted to become dull.

Absence of any indications to indicators that weaknesses due to overheating exist, plus the very practical difficulty in exercising technical supervision over all machining operations, lend significance to the findings. Experienced machinists are well aware that considerable care should be maintained in machining strong aluminum alloys to prevent overheating. More sure is the fact that the overheating resulting when cutting tools become dull may carry the material's temperature into critical ranges, in the absence of adequate coolant.

Sharp Contrast — A routine investigation run by Harvey to define indicators that produce variations in mechanical properties of machined

aluminum alloys led that firm to point up the effect of dull tools. In the first tests, a series of standard flat tensile specimens was taken from alloy 75S-T6 extruded shapes. These flats were prepared by milling one set with a sharp, well-designed cutter. They milled a second set with a dull cutter having insufficient clearance angle.

Specimens were taken adjacent to each other to preclude any variables other than temperatures during machining. The company tested four duplicate specimens of 75S-T6 alloy. In these, reductions of as much as 14.9 per cent in tensile strength and 16.4 per cent in yield strength were found, as indicated in Table I.

Projected Effect — When average characteristics were compared with those of similar specimens submitted to measured furnace temperatures, it became apparent that temperatures reached during machining with the dull cutter were in excess of 500° F for about 2 minutes. Had this temperature been maintained for as long as 5 minutes, which could occur in a heavy milling cut, tensile strength

would have been lowered by approximately 20,000 psi.

Continuing the study, tests were made of alloy 24S-T4 specimens prepared similarly. With this alloy, maximum reduction in tensile strength due to overheating with the dull cutter was 8 per cent; maximum yield strength reduction reached 31.6 per cent, as shown in Table II. The overheating had no appreciable or predictable effect on elongation characteristics.

Third Phase — In a third test phase, random 0.505-inch diameter bars were turned from 1 1/8-inch diameter extruded rod on a lathe turning at 1200 rpm. Six bars were cut with a sharp tool, six with a dull tool and no coolant was employed in either case. The alloy was high-strength HZM11-T6, an experimental aluminum-zinc-magnesium-copper type developed by Harvey. Average tensile and yield strength reductions were both about 20 per cent, as illustrated in Table III.

Results indicate that otherwise unexplainable weaknesses in machined heat-treated aluminum alloys may stem from inadvertently high temperatures during machining operations. It makes imperative the use of adequate coolant and sharp, well-designed cutting tools to gain uniform strength characteristic of finished products.

Screw Conveyor Range Shown

Comprehensive information on screw conveyors and feeders is provided in a 92-page book released by Link-Belt Co. The screw conveyor, one of the oldest and simplest conveying mediums, is also one of the most versatile, as shown by the wide assortment of materials handled. One table lists 250 materials, classifying them by size, flowability, abrasiveness, average weight and other characteristics.

Detailed engineering information, with selection tables and horsepower formulas, layouts and arrangements, dimensional data and part numbers, permits selection of screw conveyors and feeders for many applications. Typical applications of specialized conveyor screws are also shown.

Copies are available from the company, 307 N. Michigan Ave., Chicago 1.

TABLE I—75S-T6 ALLOY

Specimen	Tensile Strength, Psi			Yield Strength, Psi			Elongation, % in 2 In.	
	Sharp Cutter	Dull Cutter	Per Cent Reduction	Sharp Cutter	Dull Cutter	Per Cent Reduction	Sharp Cutter	Dull Cutter
1.	90,000	82,000	8.9	80,000	70,000	12.5	12.0	10.0
2.	88,000	78,000	11.4	80,000	67,000	16.2	11.0	10.0
3.	92,800	79,000	14.9	82,500	69,000	16.4	10.0	12.0
4.	86,300	82,000	5.0	77,700	69,000	11.2	9.5	8.5
Average Reduction			10.1	Average Reduction			14.1	

TABLE II—24S-T4 ALLOY

Specimen	Tensile Strength, Psi			Yield Strength, Psi			Elongation, % in 2 In.	
	Sharp Cutter	Dull Cutter	Per Cent Reduction	Sharp Cutter	Dull Cutter	Per Cent Reduction	Sharp Cutter	Dull Cutter
1.	63,000	60,000	4.8	46,750	32,000	31.6	18.0	15.0
2.	62,750	60,100	4.2	47,250	37,000	21.7	18.0	14.0
3.	65,500	62,000	5.3	50,000	41,000	18.0	17.0	17.5
4.	63,600	58,500	8.0	45,800	40,500	11.6	20.0	19.0
Average Reduction			5.6	Average Reduction			20.7	

TABLE III—HZM11-T6

Specimen	Tensile Strength, Psi			Yield Strength, Psi			Elongation, % in 2 In.	
	Sharp Cutting Tool	Dull Cutting Tool	Per Cent Reduction	Sharp Cutting Tool	Dull Cutting Tool	Per Cent Reduction	Sharp Cutting Tool	Dull Cutting Tool
1.	97,750	68,750	30.0	88,750	59,250	10.0	9.0	8.0
2.	95,700	82,500	20.0	86,500	74,500	9.0	8.0	8.0
3.	97,750	73,500	20.0	87,500	65,500	8.5	8.0	8.0
4.	98,000	80,000	20.0	87,500	72,000	9.0	8.0	8.0
5.	99,125	87,250	13.5	89,250	80,000	8.0	8.0	8.0
6.	97,000	76,000	14.0	85,500	66,750	8.5	8.0	8.0
Average			20.0%	69,668			—20.4%	



Special tailgate arrangement permits the 6000-pound capacity truck to unload both truck trailers quickly. Gates are dropped from rear and front to form a truck bridge



Three basic types of industrial trucks find service in the handling operation. Low-lift platform unloads, high-lift stacks skids and fork model handles skids or pallets

Casting Jam-up Yields to Mechanical Handling

MECHANIZED handling of castings not only slashed transportation costs 50 per cent, but eliminated completely the expensive variables of manual effort. Incoming loads are handled eight times faster by trucks that move 640 tons a day.

This is the summary Chevrolet Motor Co. makes to show how its Flint, Mich., plant licked a problem of handling incoming castings that recently threatened to become acute.

An Army of Men — Castings designated for automotive engines were dumped into railroad cars at the foundry. When they arrived at

the engine plant, parts had to be sorted, counted and loaded manually into pushcarts for transfer to storage. The job required an army of men, caused inefficient and excessive physical effort. Other liabilities followed naturally: Counts were inaccurate and loose shipment made freight rates high.

To inject some order and clear away unnecessary manpower, the plant enlisted co-operation at the source of its troubles and helped itself at the other end.

Ordered Delivery—As a result, each casting class leaves the foundry in a special skid box. Road trucks now deliver skids to the

assembly plant. At the receiving dock, an Elwell-Parker low-platform truck moves directly into the over-the-road vehicle and transfers skids to the dock. Another E-P truck double stacks the skids in storage or takes them immediately to production machines. Each truck handles 40 tons an hour, 16 hours a day.

Chevrolet says transportation costs were halved. The powered platform truck unloads a 12-skid truckload in 15 minutes—in sharp contrast to the discarded manual method that required several hours. Finally, but still very important inventories are always accurate.



Skids are delivered to the production area by truck and placed on a tilt rack, a positioner designed to facilitate unloading of parts at the machine work stations



Trucks place boxes with swing-up doors on tilt racks so contents flow within reach of operator. This method upped machine productivity 100 per cent over hand unloading



They're still talking in shops that use

J & L "1200" COLD FINISHED STEEL

Shop records keep proving the logic of using **J & L "1200" COLD FINISHED STEEL** in terms of **SUPERIOR MACHINABILITY**, **HIGHEST QUALITY FINISHES**, **DEPENDABLE UNIFORMITY** and **EXCEPTIONAL EFFICIENCY** from machines and operations

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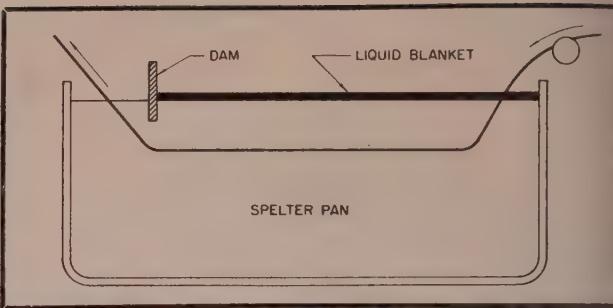


Fig. 1—Diagram above shows the liquid chemical blanket for spelter pans

Fig. 2—Crystals added to galvanizing pan maintain fluidity of blanket

Liquid Blanket

REDUCES OXIDATION OF MOLTEN ZINC

Regenerative crystals added to galvanizing bath serve to maintain fluidity of blanket which in turn effects sharp reduction of dross formation

By A. A. PATERSON
Dewey & Almy Chemical Co.
Chicago

CONSIDERABLE zinc is lost annually in the wire galvanizing industry because of the formation of oxide and dross. The oxide or ash, formed by the combination of oxygen in the air and molten zinc in the pan, contains about 80 per cent zinc. Since the recovery value is small the formation of such a zinc oxide either in the gaseous or ash form represents an annual loss totaling hundreds of thousands of dollars.

From the beginning of the galvanizing art, many attempts were made to prevent formation of this oxide by covering the exposed surface of molten zinc with dry materials, such as the oxide or ash itself, diatomaceous earth, or carbon in any of its many forms. These dry methods offered some protection, but because of the air diffused through these porous dry blankets, oxidation continued. In addition, these dry blankets interfered with the stringing of wires and with the drossing operation.

Surface Is Sealed—Obviously, the best method to overcome this problem was to utilize a liquid which would completely seal the surface of the zinc pan from the oxygen of the air and remain fluid over the life of the pan, as shown in Fig. 1. Many attempts were made to use various combinations of zinc and ammonium chlorides. Most of these chloride combinations showed up well for a limited period, but after a few hours in service they thickened to the point where they had to be removed.

Over ten years ago research work with tinning and soldering crystals, led to an investigation of a liquid blanket for galvanizing pans which would remain fluid for a reasonable length of time, and require little, if any, extra labor for maintenance.

Experiments with this liquid blanket continued and finally resulted in the development of regenerative crystals which when added to the liquid blanket tend

to maintain its fluidity. Some of the field test data are presented in the accompanying tables. A different method is used in each table for calculating costs and savings depending upon the interests and method of cost evaluation in the particular plant. Also, the percentage savings may vary somewhat from one pan to another even in the same plant, depending largely upon the type of galvanizing, weight of wire, practice of the individual galvanizer, size of pan, temperature, etc. An interesting observation is that in all of these figures the reduction of the formation of zinc oxide is almost in direct relation to the proportion of the galvanizing pan covered with the blanket.

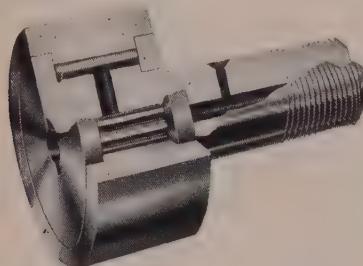
Portion Is Unblanketed—Normally a portion of the galvanizing pan is dammed off sufficiently to allow the galvanized wire to come out through an unblanketed section. However, one plant found that on a frame of galvanizing wire for re-

CAM ACTION IMPROVED with **MULTIROL® BEARINGS**

under heavier loads • with shock resistance • and space economy

Modern demands for faster, more automatic machines necessitate a new approach to cam action efficiency. Improvised bolt and roller units are no longer adequate for this mass production machine.

Machinery manufacturers are finding that even at slow speed, it is difficult to carry the usual heavy radial and intermittent shock loads of cam application efficiently on plain bearings or standard anti-friction ball and roller bearings. With increasing speeds, and lubrication limited by the desire for simplified design, the plain bearing wears excessively and fails early. Ordinary ball or radial roller bearings used on a shaft as cam followers have a



tendency to split in the outer race because of the excessive strain on the thin and superhard race sections.

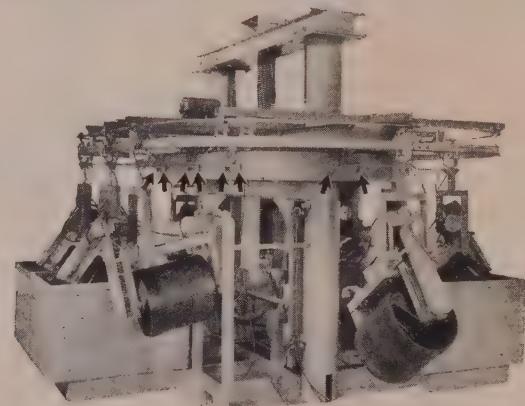
One bearing that has proven particularly successful in cam follower applications is the Multirol CF series full type roller bearing. This bearing is built specially for the repeated shock loads of typical cam action operations. The outer race section is not only heavy radially but is also martempered to combine maximum toughness with adequate surface hardness for withstanding the punishment of cam applications. The outer ring operates on a full complement of small diameter rollers so the load is evenly distributed over a greater bearing surface. The inner race and flange are made in a single piece with the stud, preventing any possibility of disassembly in operation. Greater accuracy is maintained throughout longer bearing life and, compared with plain bearings, both starting and rolling friction are reduced to a minimum. As a result internal wear is diminished and power requirements of Multirol bearing equipped machines are appreciably lessened.

Load Capacity Comparison

To illustrate the increased capacity of the Multirol CF, here is a comparison between a Multirol CF-1 bearing and a corresponding friction type roller, making use of the maximum permissible bearing pressures in pounds per square inch of projected area. The CF-1 bearing will have a maximum of 2240# while the equivalent friction type roller would have a capacity of less than 400#.

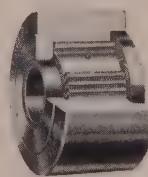
What This Means in Terms of Performance

The James Hunter Machine Co. of North Adams, Massachusetts replaced units consisting of a standard roller bearing and hardened roller with Multirol CF bearings on eccentric cams that actuate rake teeth in their wool washers. The changeover reduced their original and replacement costs over 10% and reduced maintenance to occasional lubrication. Where previously, rollers only lasted a maximum of several months, no replacements have been required with the Multirol bearings. As a result, the Multirol Bearings solved a trouble spot that brought in many customer complaints.



Crown Rheostat and Supply Company of Chicago uses up to 200 Multirol Cam Followers as guide and support rollers in the travel and transfer mechanism of their cleaning, plating, and drying machines. Formerly trolleys were suspended from rails but the cam follower units proved to be a more precision means of friction reduction and added stability to the supporting arms.

Other **McGILL®** Bearings



MULTIROL CYR



MULTIROL SE



GUIDEROL CT

A new 140-page Bearing Reference Guide complete with 30 pages of vital engineering data has just been released by the McGill Manufacturing Company. It has the full story on the advantages of Multirol CF Bearings as well as information on the Multirol CYR, Multirol SE and Guiderol Bearings. Send now for your copy of McGill Catalog No. 52.

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301 N. Lafayette Street, Valparaiso, Indiana



Fig. 3—One of the most important functions of the blanket is the elimination of noxious zinc oxide fumes

drawing, better results are obtained by completely covering the pan, allowing the wire to come out through the liquid blanket. Also reported is the depositing of a heavier zinc coating. In this case a special double wipe is necessary.

Another real saving on practically all liquid blanket installations is the reduction of dross formation. Why this occurs is a mystery, but still it is a definite saving. The answer possibly lies in the reduction of the available iron ion through the use of the crystals as a preflux and the fluxing action of the blanket immediately prior to entry into the zinc pan. The amount of reduction varies widely but only one installation without dross saving was noted.

Other advantages of the liquid blanket, in addition to the savings in zinc, follow:

A definite reduction in the spattering of zinc both at the point where the wires enter the pan and also when pigs are added to the pan. The greater surface tension of the liquid blanket compared with the dry blanket accounts for this.

The virtual elimination of noxious zinc oxide fumes by preventing their formation. This feature alone is one of the most important functions of the blanket.

Reduction of prefluxing costs by using a solution of the régénera-

TABLE I					
Savings Per 100 Pounds of Zinc Applied to Wire					
	Without blanket, lb	With blanket, lb	Unit cost, \$		Saving,
Blanket crystals used	None	82	0.156*		12.79
Oxide skimmings produced	550	86	0.0975**		45.24
Dross produced	378	43	0.039**		13.07
Net saving per 1000 lb zinc on wire					\$45.52

* This includes 1c per pound freight.

** Difference in original cost of high-grade zinc content (13.0c per pound) and sale value of oxide skimmings or dross (using 25% as value of skimmings and 70% as value of dross). Size of kettle: 3 x 10 ft
Area covered by blanket: 24 sq ft

TABLE II
Savings in Zinc on Galvanizing Frame Running 6 to 18 Gage Wire

	With liquid blanket*	Same frame with diatomaceous earth**	Savings through use of liquid blanket
Tons of wire	8122	926	
Skimmings	35,084	13,605	10.3 lb/ton less skimmings with liquid blanket (70.5% saving)
Lb/ton	4.3	14.6	
Dross	127,060	34,910	22.2 lb/ton less dross under blanket
Lb/ton	15.6	37.7	
Zinc	562,275	87,175	24.9 lb/ton less zinc used under blanket (26.5% saving)
Lb/ton	69.2	94.1	

* Accumulated figures on 7 months' production.

** Represents figures on 1 month's production.

TABLE III
Demonstrated Savings in Daily Consumption of Spelter
on Fine Wire Galvanizing Frame 16 Inches Wide by 96 Inches Long

	Lb
Average daily consumption* of zinc prior to use of blanket**	330
Average daily consumption of zinc using blanket	110
Zinc savings obtained through use of blanket	220

* 24-hour day, 7-day week

** No covering, other than ash, used prior to test

TABLE IV

	Savings Shown on Frame Running 12 Gage Wire		Savings obtained through use of liquid blanket
	With liquid blanket	Without liquid blanket	
Zinc	36.5 lb/ton	41.0 lb/ton	4.5 lb/ton or 11.0% less zinc used for similar weight of wire run.
Skimmings (Ash or oxide)	3.7 lb/ton	10.0 lb/ton	6.3 lb/ton or 63% less skimming produced with liquid blanket.

Liquid blanket cost which included use of blanket crystals as prefix to approximately 40.0c/ton
All figures are based on tons of wire run over period of approximately 5 weeks.

tive crystals as a preflux. This automatic addition also minimizes the maintenance cost of the blanket. With this preflux method, additions of the crystals as shown in Fig. 2* are made at the rate of one to two shovelfuls each shift. These new additions quickly enter into the liquid blanket, as shown in Fig. 3.

In many cases the necessity of a burlap wipe between the preflux tank and the spelter pan is eliminated, due to a great reduction of spattering.

Insulation value of the liquid blanket reduces heat losses. In one particular test the surface of the liquid blanket was 410° F cooler than the surface of the zinc oxide ash when the blanket was not employed.

Increased production of galvanized work per ton of zinc available in workhouse stocks. Elimination

of ash formation in the blanketed area and the expected reduction of dross formation means that less zinc is required to galvanize a given tonnage of wire.

This new liquid blanket has shown savings of \$0.50 to \$1.50 per ton of wire run as well as the possibility of reducing zinc inventory 10 to 50 per cent.

The most serious problem generally encountered is the escape of the white ammonium chloride smoke, particularly when the blanket is first applied. This is not objectionable to the workmen when adequate ventilation is provided. Various combinations of flues and exhaust systems are effective depending upon the facilities and requirements of the individual plant. After the blanket is formed initially, the continued evolution of ammonium chloride is slight and hardly noticeable.

*Photos are by Dahlhauser, Keystone Steel & Wire Co., Peoria, Ill.

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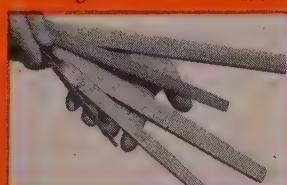
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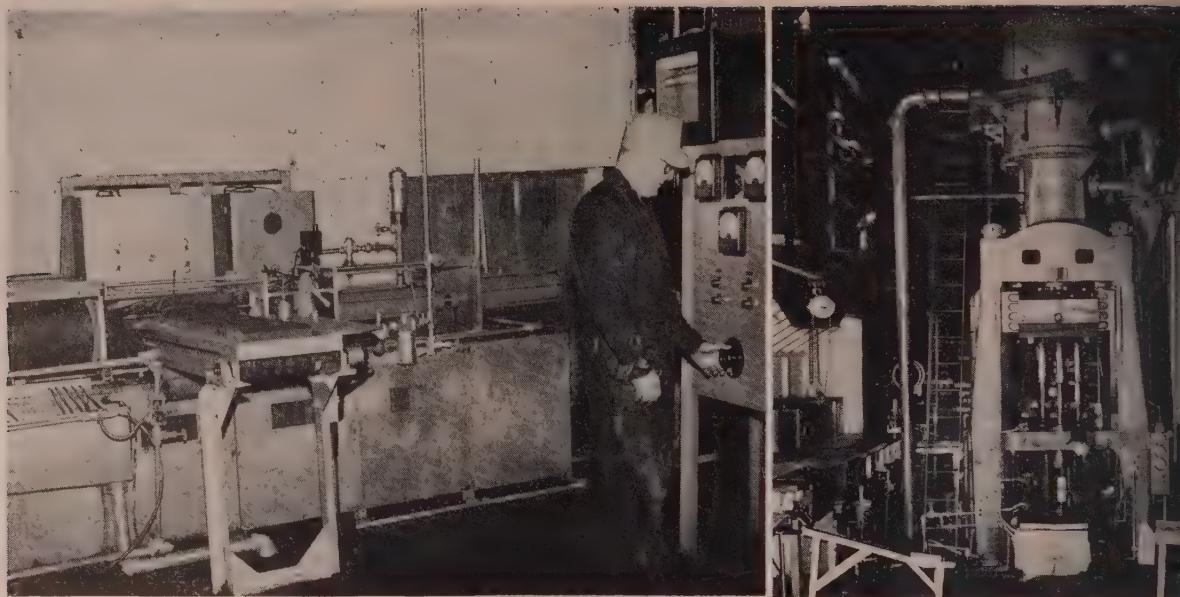
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View of the loading end of the 1200 kw billet heater shows the ram (behind operator) which pushes billets into the low frequency coil at the left. The discharge end of the heater and the shell forging machine are shown at right.

DUAL FREQUENCY HEATING:

Lower Costs Open New Fields

Low frequency coils in tandem with high frequency high-heat coils prove that induction heating can be practical in forging applications. Future looks bright

By M. E. HACKSTEDDE
Manager
GECO Inc.
Cleveland

DUAL FREQUENCY induction heating is out of the pilot installation stage.

Developed several years ago by General Engineering Co. Ltd., Toronto, Canada, as a means of reducing costs of induction heating for many applications in the field of forging, heat treating and melting, it is now standard equipment at the Lindsay, Ont., plant of Canadian Arsenals Ltd.

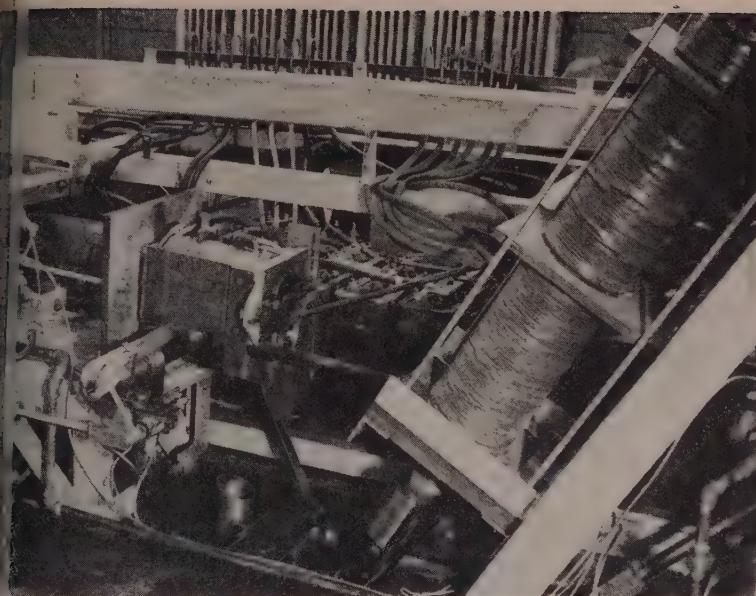
Billet heating for shell forging, and shell hardening and drawing are accomplished on dual frequency machines at Lindsay. Heating tunnels on both machines are made up of sections containing the 60-cycle inductor coils for heating to 1400° F and the high heat sections con-

taining coils delivering nearly 1000 cycles. Low frequency coils work on line voltage up to 550 volts without frequency converters or transformers. Where high frequency power is required, General Engineering has designed and had built self-excited generators said to be more rugged and cheaper than present motor generators.

Billet Heater — Briefly, a billet heater is made up of two main parts: A billet feeder mechanism consisting of a feed magazine and a hydraulically-operated ram for pushing the cold billet into the heating tunnel, and a heating tunnel consisting of several inductor coils mounted in tandem and with suitable liners.

The only manual operation required is the loading of the feed magazine with cold billets as the heated billet is ejected from the heater to a position handy to the press or hammer. Usually in a billet heating operation about half the total power required can be applied to the inductors directly from the 60-cycle line, the balance being at a higher frequency. Such an arrangement eliminates one half the motor generator capacity required with a substantial reduction in equipment cost.

Efficiency Advantage — Production figures up to 6½ pounds per kilowatt hour (measured at the power companies' 60-cycle meter) can be obtained, so it is evide-



Heated inductor coil drops heated shell through chute into quench tank below floor level, from where it is lifted into the inclined drawing coils at right. Operation is completely automatic except for manual loading of line

at no loss in efficiency results from the use of 60-cycle preheat. Because of the much greater penetration of the 60-cycle current it is possible to heat at a more rapid rate without overheating the outside surface of the billet than with higher frequencies. Consequently the over-all heating time for each billet can be reduced and better uniformity of temperature from the center to the outside surface of the billet can be obtained.

Hardening and Drawing—Another unique operation is also in daily production at the Lindsay plant. This dual frequency machine completely hardens and draws 3-inch, 50-caliber antiaircraft shells at the rate of 60 per minute in a space 6 feet wide by 18 feet long. The gravity conveyor for air cooling the shell from the draw, extends another 20 feet in the line.

Problems in heating a hollow shell with a solid base and a tapering tubular body to a uniform temperature throughout with induction heating are many. In fact with the usual frequencies used, it is quite impractical. However, by the careful selection of frequencies shells are uniformly heated, quenched in oil, and drawn, in a continuous operation with completely automatic control from the

feeding of the shell into the heating tunnel until it emerges as a hardened and drawn shell at the end of the cooling conveyor.

Hand Loading—One man loads the feed magazine, although this too could be an automatic transfer from the previous operation if the production rates were the same. In this operation as in the billet heater, cold shells are pushed, one after another, at regularly timed intervals into the 60-cycle portion of the heating tunnel.

The shell leaves the 60-cycle section at approximately 1400° F and enters the high frequency inductors where it is brought up to quenching temperature. This section is made up of two coils powered by a self-excited generator delivering somewhat less than 1000 cycles. The first of these coils is stationary and mounted directly in line with the 60-cycle coils. The second coil is mounted on a pivot and is tilted from a horizontal to a vertical position by a pneumatically-operated cylinder.

Oil Quenching—When the shell in this coil has reached the desired temperature it is tilted and the shell drops into the oil quench tank below. Oil is maintained at a constant level and is circulated through a Niagara heat exchanger

to maintain it at the desired temperature. The shell drops into the tank open end down so that it is positioned over a spigot through which quench oil is discharged into the tank.

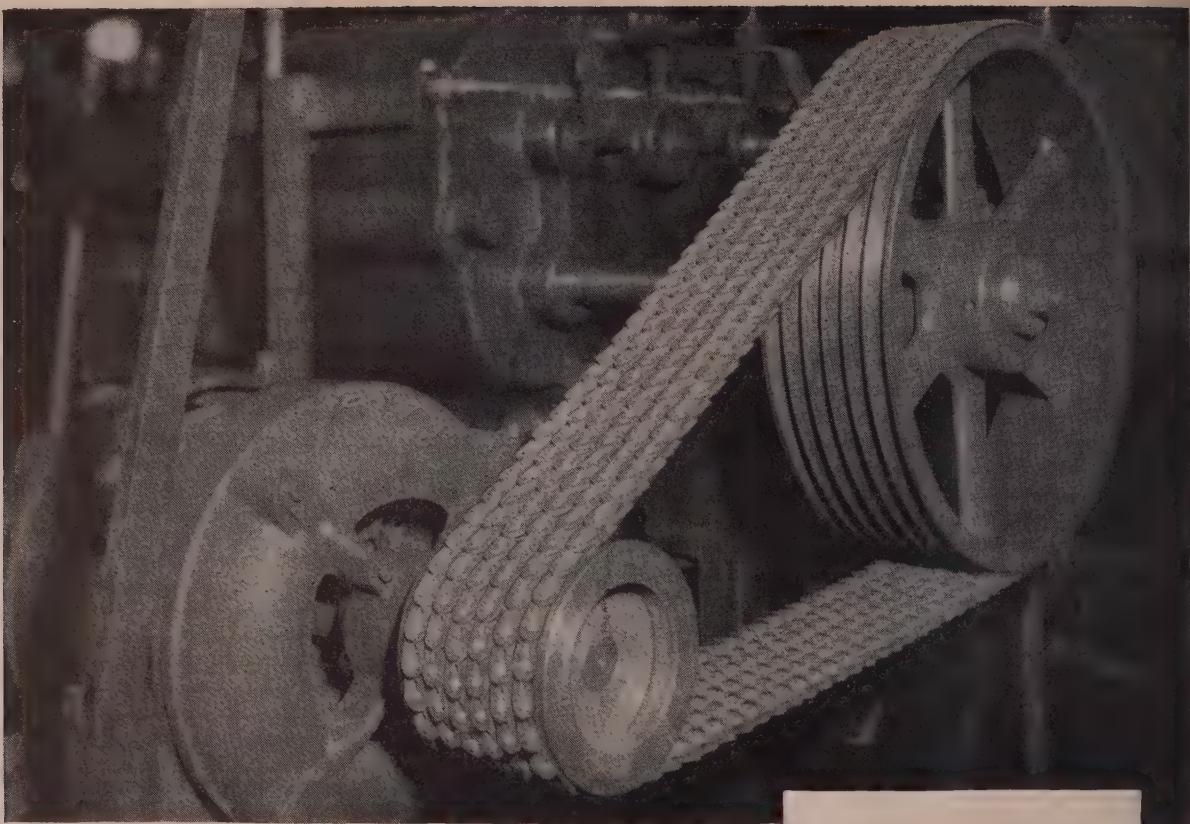
Other jets of oil directed at the external surfaces of the shell assure fast and uniform quenching. At a predetermined time the spigot is automatically tilted so that the shell is moved into an inclined position from which another pneumatic device lifts it into the inclined draw coils.

Low Frequency Draw—The shell is drawn at approximately 1000° F or whatever temperature that heat of steel may require. The draw coils are powered directly from the 550-v 3-phase 60-cycle power line. When the shell emerges from the inductors about 8 feet above floor level it has been heated uniformly to the exact temperature required to produce the physical specifications for that shell.

After the heated shell leaves the draw coils it travels on a gravity conveyor which is long enough to hold one full lot of shell and which retains the shell until it has air cooled to a safe temperature for rapid cooling. It is then water cooled to room temperature for handling and passes over another conveyor back into the machining line.

Many Advantages — This heat treating unit is extremely simple and trouble free. It can be started into production in a few minutes and stopped by pushing a button. When the unit is not in operation it uses no power. While it is possible to equip it with elaborate temperature and electrical controls, experience has proved that such instruments are not required and add nothing to the operation but increased cost.

This particular machine has one ammeter indicating the current in one of the high frequency coils. As long as this meter is reading at a predetermined value, the shell in that coil has reached the proper temperature. It is possible to adjust both the rate of feed of the shell and the power input to the various coils, however, minor variations in shell can be compensated for easily by adjustments of the rate of feed.

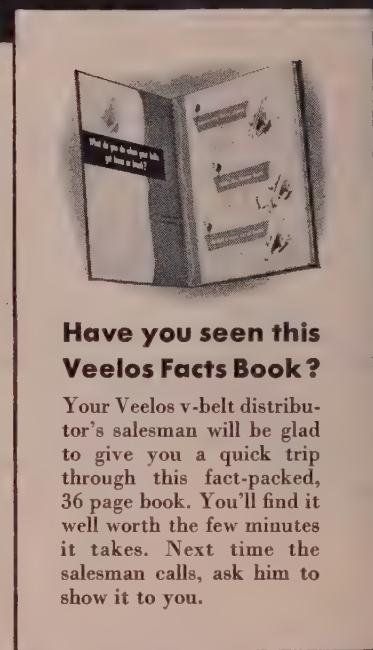


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is a production-saving job**

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CALENDAR OF MEETINGS

April 14-15, Westinghouse Machine Tool Electrification Forum: Annual session, Hotel Statler, Buffalo. Information: E. F. Grapes, technical publicity, Box 2278, Pittsburgh 30.

April 14-16, Conveyor Equipment Manufacturers Association and University of Illinois Department of Engineering: Conveyor institute, University of Illinois, Champaign, Ill.

April 16-17, American Machine Tool Distributors Association: Spring meeting, Netherland Plaza hotel, Cincinnati. Association address: 1900 Arch St., Philadelphia 3. Secretary: Thomas A. Fernely Jr.

April 16-17, The Wire Association: Regional meeting, Stacy-Trent hotel, Trenton, N. J. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

April 16-19, Grinding Wheel Institute: Spring meeting, The Homestead, Hot Springs, Va. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: Hunter-Thomas Associates, re F. A. Peterson.

April 18-19, Packaging Machinery Manufacturers Institute: Spring meeting, Hotel Sherman, Chicago. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Eratton.

April 19-23, American Hardware Manufacturers Association: Spring meeting, Hotel Adolphus, Dallas. Association address: 342 Madison Ave., New York 17. Secretary: Arthur L. Faubel.

April 20-22, Metal Powder Association: Annual meeting and exhibit, Hotel Cleveland, Cleveland. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 20-22, AIME Blast Furnace, Coke Oven & Raw Materials Committee and National Open Hearth Steel Committee: Annual conference, Hotel Statler, Buffalo. Institute address: 29 W. 39th St., New York 18.

April 20-23, American Management Association: National Packaging Exposition: Navy Pier, Chicago. Association address: 330 W. 42nd St., New York 36. Information: Donald G. Keen.

April 20-23, National Screw Machine Products Association: Spring meeting, Hotel St. Moritz, New York. Association address: 2860 E. 130th St., Cleveland 20. Secretary: Orrin B. Wernitz.

April 20-23, Society of Automotive Engineers: Aeronautic production forum; national aeronautic meeting, and aircraft engineering display, Hotels Governor Clinton & Statler, New York. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

April 21-23, Caster & Floor Truck Manufacturers Association: Spring meeting, Edgewater Beach hotel, Chicago. Association address: 27 E. Monroe, Chicago. Secretary: H. P. Dolan.

April 22-23, American Institute of Steel Construction Inc.: Spring engineering conference, Detroit Engineering Society Bldg., Detroit. Institute address: 101 Park Ave., New York. Executive vice president: L. Abbott Post.

April 25, American Society for Metals, Indiana Chapters: Annual spring symposium, Purdue University, W. Lafayette, Ind. Information: A. D. Carvin, Joslyn Stainless Steels, Ft. Wayne, Ind.

April 26-30, American Ceramic Society: Annual meeting, Hotel Statler, New York. Society address: 2525 N. High St., Columbus 2, O. Secretary: Charles S. Pearce.

April 27-28, American Zinc Institute Inc.: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary: E. V. Gent.

April 27-28, Galvanizers Committee, American Zinc Institute: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary-Treasurer: E. V. Gent.

April 27-28, Independent Petroleum Association of America: Midyear meeting, St. Louis.



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Association address: Box 1019, Tulsa, Okla. President: Charlton H. Lyons.

April 27-28, Copper & Brass Research Association: Annual meeting, Drake hotel, Chicago. Association address: 1420 New York Ave. NW, Washington 5. Corresponding secretary: Mrs. Elizabeth Dyer.

April 27-May 2, Concrete Reinforcing Steel Institute: Annual spring meeting, The Carolina, Pinehurst, N. Carolina. Institute address: 38 S. Dearborn St., Chicago 3. Managing director: H. C. Delzell.

April 27-May 8, British Industries Fair: Castle Bromwich, Birmingham, and Earls Court, London, Eng. Information: Larry Nixon, 575 Madison Ave., New York 22.

April 23-30, American Society of Mechanical Engineers: Spring meeting, Deshler-Wallick hotel, Columbus, O. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

April 29-May 1, Boston Section, American Institute of Electrical Engineers: North-

eastern district meeting, Hotel Sheraton Plaza, Boston. Institute address: 33 W. 39th St., New York.

April 29-May 1, Radio-Television Manufacturers Association: Electronic Components Symposium, Shakespeare Club, Pasadena, Calif. Information: Suite 1011, 621 S. Hope St., Los Angeles 17.

May 3-7, Liquefied Petroleum Gas Association: Annual meeting and exhibit, Hotel Conrad Hilton, Chicago. Association address: 11 S. LaSalle St., Chicago 3. Secretary: Arthur C. Kreutzer.

May 4-6, National Small Businessmen's Association: Annual meeting, Hotel Mayflower, Washington. Association address: Evanston, Ill. Vice president: A. W. Kimball.

May 6-8, Porcelain Enamel Institute: Mid-year divisional meetings, Edgewater Beach hotel, Chicago. Institute address: 1346 Connecticut Ave. NW, Washington 6. Secretary: John C. Oliver.

May 7-8, The Wire Association: Regional

meeting, Mt. Royal hotel, Montreal. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

May 8, American Society for Metals: New England regional meeting, Hotel Bond, Hartford, Conn. Information: Walter E. Birn Underwood Corp., Hartford 6, Conn.

May 7-8, Industrial Fasteners Institute: Annual meeting, Westchester Country Club Rye, N. Y. Institute address: 3648 Euclid Ave., Cleveland. Secretary: James D. Eggers.

May 11-13, Rail Steel Bar Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 38 S. Dearborn St., Chicago 3. Secretary: W. H. Jacobs.

May 11-14, American Mining Congress: Annual meeting and exposition, Public Auditorium, Cleveland. Congress address: 110 Ring Bldg., Washington 6. Executive vice president: Julian D. Conover.

May 14, Conference, Instrumentation in Water Sewage and Industrial Waste Treatment Manhattan College, New York. Information: Joseph McCabe, Civil Engineering Dept., Manhattan College.

May 14-15, National Association of Sheet Metal Distributors: Spring meeting, Deshler-Wallick hotel, Columbus, O. Association address: 1900 Arch St., Philadelphia 3. Secretary: Thomas A. Fenley Jr.

May 14-16, American Coal Sales Association: Annual spring meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 1625 Eye St. NW, Washington. Executive vice president: W. W. Bayfield.

May 14-16, American Institute of Mining Metallurgical Engineers: Pacific Northwest metals and minerals conference, Hotel Benjamin Franklin, Seattle. Institute address: 29 W. 39th St., New York 18. Secretary: E. H. Robbie.

May 18-19, National Fluid Power Association: Organization meeting, Bedford Springs hotel, Bedford Springs, Pa. Association address: 1618 Orrington Ave., Evanston, Ill. Temporary executive secretary: Barrett Rogers.

May 18-19, Association of Iron & Steel Engineers: Spring meeting, Hotel Statler, Buffalo, N. Y. Association address: 1010 Empire Bldg., Pittsburgh. Secretary: T. J. Ess.

May 18-20, Industrial Furnace Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York.

May 18-22, Material Handling Institute: National Material Handling Exposition, Convention Hall, Philadelphia. Institute address: 811 Clark Bldg., Pittsburgh 22. Managing director: R. Kennedy Hanson.

May 18-22, Conference, Cam Design and Tool Selection: Rochester Institute of Technology, Rochester, N. Y. Information: Robert L. Pease, associate director, RIT.

May 20-22, Gas Appliance Manufacturers Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 60 E. 42nd St., New York 17. Secretary: H. Leigh Whitelaw.

May 20-22, Society for Experimental Stress Analysis: Spring meeting, Hotel Schroeder, Milwaukee. Society address: Box 188, Cambridge 39, Mass. Secretary-treasurer: W. M. Murray.

May 21-22, National Industrial Conference Board: General session and directors meeting, Waldorf-Astoria hotel, New York. Board address: 247 Park Ave., New York. Secretary: Clyde L. Rogers.

May 24-27, Copper & Brass Research Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York 17. Secretary: B. C. Caddie.

May 24-28, Scientific Apparatus Makers Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 20 N. Wacker Drive, Chicago. Executive vice-president: Kenneth B. Anderson.

May 24-28, National Industrial Service Association: Annual convention, Hotel Statler, New York. Association address: 818 Olive St., St. Louis 1. Executive secretary: Fred B. Whippleman.

May 26-27, Electric Heating Committee and Michigan Section, AIEE: Conference, Detroit Leland hotel, Detroit. Institute address: 29 W. 39th St., New York 18. Information: W. C. Rudd.



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For complete information send for Bulletin TR.



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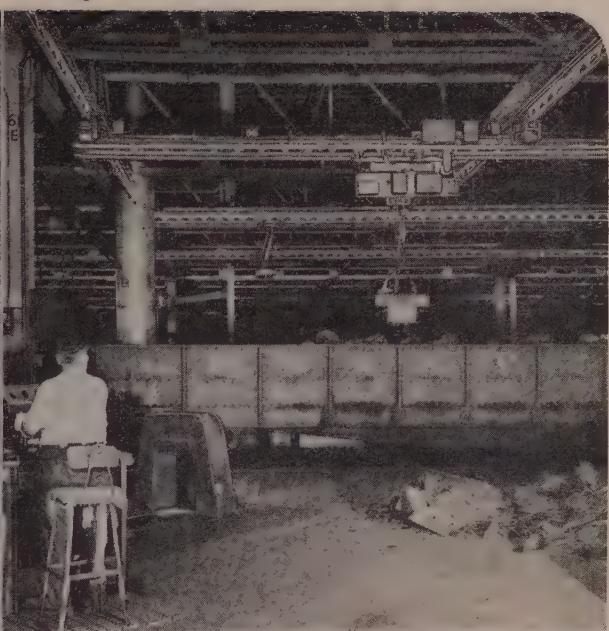
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Scrap from slat conveyor is dumped on floor at left. Crane with magnet then takes it to baling machine next to operator who operates all controls — crane, magnet, baler — from this one point.

CRANE HANDLES ONE CARLOAD OF SCRAP THROUGH BALER EVERY TWO DAYS

Both Crane and Baler Operated by One-Man Pulpit Control

SCRAP handling and baling have been made an extremely efficient one-man job at the Buffalo, N. Y., electric motor plant of Westinghouse Electric Corporation with a Cleveland Tramrail crane. Scrap metal is collected on a slat conveyor which extends some 300 feet under the floor, serving a number of punch presses. Near the baling department it is conveyed up an incline and dumped on the floor. Here a 3-ton, 3-runway magnet-handling Cleveland Tramrail crane takes over. It brings the scrap to a baling machine sunk in the floor. The scrap bales made here are placed into a gondola car by the same

crane. The entire operation of crane and baling machine is controlled by one man seated at a pulpit, working with push buttons.

Bales measure about 10"x12"x18" and weigh an average of 300 lbs. From 300 to 425 bales are required to fill a railroad car depending upon car capacity. Approximately one carload is baled and shipped every two days, working two shifts (16 hours) a day.

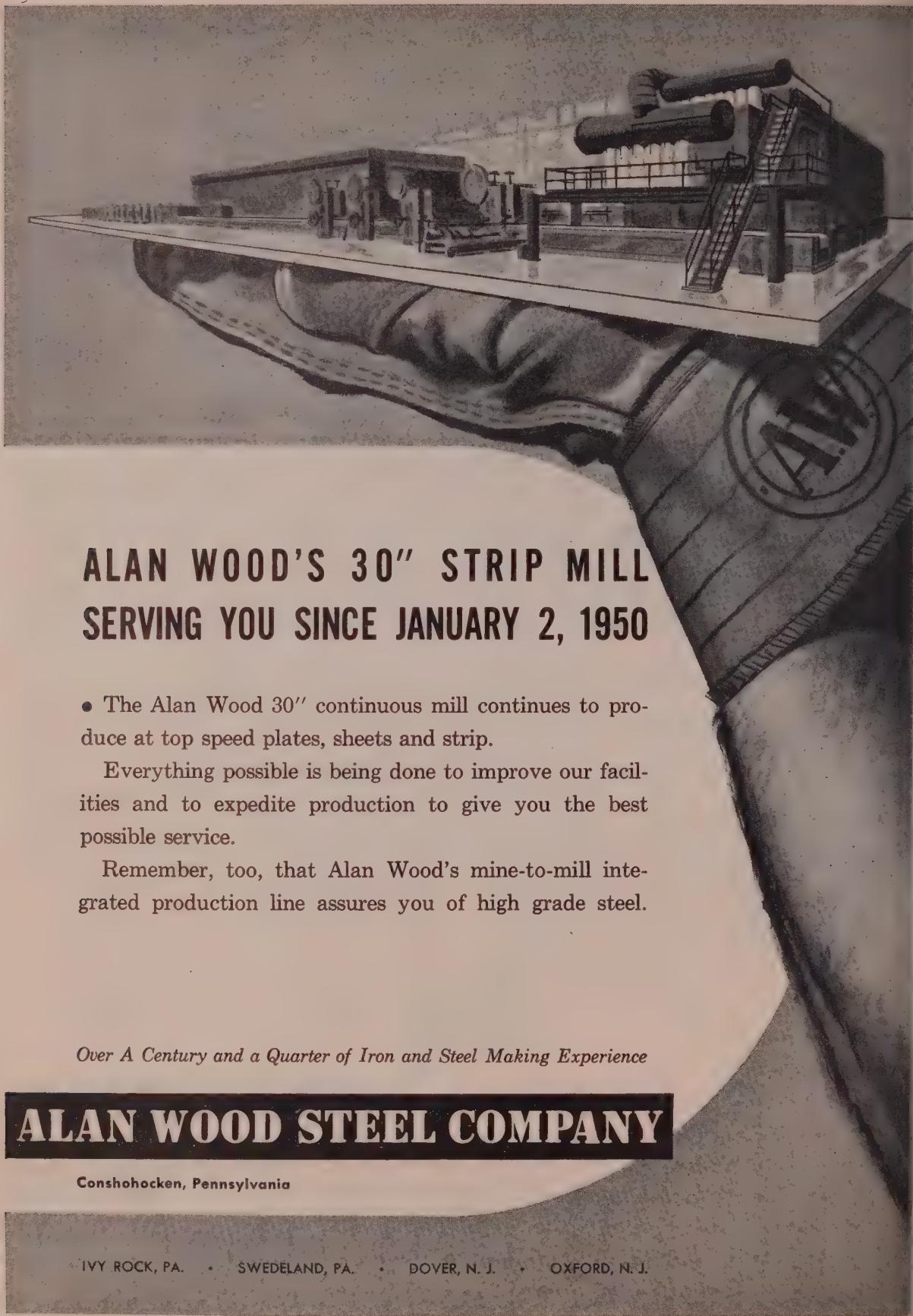
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LABOR TROUBLES that have held down steel production the last two weeks may be just the beginning of quickie strikes that will plague the steel industry the next few months, but you can rule out the possibility of an industry-wide steel strike.

Latest flare-up was a strike last week of 100 employees of a U. S. Steel Corp. railroad serving U. S. Steel plants at Youngstown. Without materials transportation, the steel plants could do nothing but close down. This idled about 10,000 steelworkers and cost 8000 tons of ingot output daily.

The preceding week was marred similarly by a five-day strike on a U. S. Steel railroad serving U. S. Steel plants in the Pittsburgh district.

COMING UP—Other quickie strikes may arise without authorization while the United Steelworkers of America-CIO and the steel companies negotiate on wages. Such strikes often occur during this period.

The union's president, David J. McDonald, called a meeting of the union's executive board and wage policy committee for Apr. 27 and 28 at Atlantic City, N. J., to map a wage program to present to the steel industry.

Under agreements signed last summer after the two-month nationwide steel strike, either the union or the industry can give notice to the other on or before May 1 of its desire to negotiate concerning a change in wage rates. Presumably this formal notice to the companies will be given after the wage policy committee meeting in Atlantic City.

THE THREAT—Negotiating sessions must begin within 30 days after May 1. If there is no agreement by midnight of June 30, the steelworkers are free to strike to enforce their demands. Although any wage negotiations might boil over into a strike, there are deterrents to a strike this year. Among them are: 1. It was only last summer that the steelworkers were out on a long strike, and they aren't eager to be on strike so soon again. 2. The slight softening that's evident in some quarters of

the steel business may have a sobering effect on demands and attitudes of the steelworkers' union. 3. For the first time the union will not have the government supporting it in negotiations.

PARTIAL RECOVERY—The strike in the Youngstown area, the aftereffects of the Pittsburgh district strike and shutdown of a Pittsburgh district open-hearth shop for inspection held the rate of output of steel for ingots and castings to 98 per cent in the week ended Apr. 11. Were it not for these interruptions the rate could have been three of four points higher.

CONTRASTS—While heavy demand from the automobile industry keeps some forms of steel, particularly light flat-rolled, in tight supply, other forms continue to ease or show signs of easing.

Heavy and wide plates have been in tight supply but in the Pittsburgh area there are definite signs producers would like assurance of a solid market for the fourth quarter. In lighter gage plates, producers are almost current with their order books.

BUILDING INVENTORIES—Demand for high carbon wire continues strong and a good third quarter is expected, but it may not equal output of the first two quarters. Even if automotive and furniture makers continue their strong demand for material, other customers are currently buying in excess of needs and probably will have good inventories by third quarter.

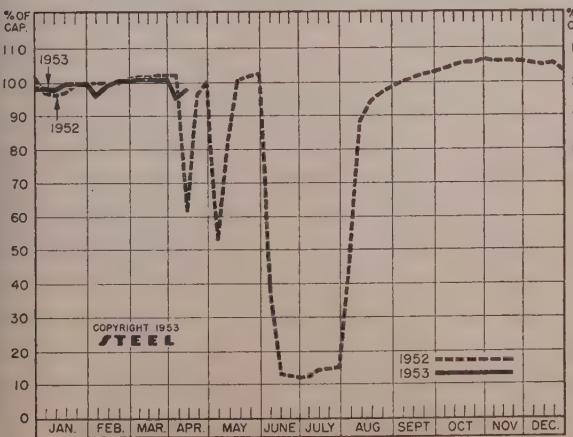
PRICE PICTURE—Buttweld pipe stocks are building up, and some distributors are lowering their prices for it.

Because slow business at foundries is holding down demand for merchant pig iron, there is some talk of freight absorption by pig iron sellers who want to go farther afield for customers.

The good stocks of scrap mills now have are inducing a softening of scrap prices.

Not all price trends were down, however. Bolt, nut and rivet prices are being raised an average of 2 to 3 per cent.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Apr. 11	Change	Same Week 1952	1951
Pittsburgh	95.5	+ 17.5*	62	101.5
Chicago	105.5	- 2*	52.5	106
Mid-Atlantic	96.5	- 0.5	76	100.5
Youngstown	105.5	- 0.5	40	106
Wheeling	101	0*	89	94.5
Cleveland	101.5	+ 2.5	48.5	101.5
Buffalo	108.5	0	35	104
Birmingham	101	+ 2	50	100
New England	91	- 1	67	89
Cincinnati	98.5	+ 1.5	60	102
St. Louis	71.5	- 9.5	73.5	92.5
Detroit	109	+ 2	91	103.5
Western	110	- 2	89.5	107
Estimated national rate	98	+ 3	61.5	102.5

*Change from preceding week's revised rate.
Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

Composite Market Averages

FINISHED STEEL PRICE INDEX:
Bureau of Labor Statistics
(1947-1949=100) Apr. 7 Mar. 31 Month March
1953 1953 Ago Average
130.7 130.7 130.7 130.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)

Week Ended Apr. 7, 1953

Units are 100 lb except where otherwise noted below in parentheses.
For complete description of products see insert following p. 28, STEEL,
Sept. 8, 1952.

Rails	\$3.775	Sheets, C.R. carbon	\$5.275
Track spikes	6.650	Sheets, galv.	6.765
Track bolts	9.955	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.333
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.090
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft)	8.778
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	6.685	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.153	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire, fence, galv.	6.425
Bars, reinforcing	4.050	Nails (100 lb kegs)	7.410
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spool)	5.880
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.629

FINISHED PRICE INDEX, Weighted:

Calculated by STEEL* Apr. 9 Week Month Year 5 Yrs.
1953 Ago Ago Ago Ago

Index (1935-39 av.=100) 181.81 181.31 181.31 171.92 135.91

Index per cent per lb. 4.912 4.912 4.912 4.657 3.682

ARITHMETICAL PRICE COMPOSITES:

Calculated by STEEL*

Finished Steel NT	\$110.98	\$110.98	\$110.98	\$106.32	\$81.14
No. 2 Fdry, Pig Iron, GT	55.04	55.04	55.04	52.54	39.65
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	39.18
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	40.26
Steelmaking Scrap, GT	43.33	43.75	45.00	43.00	40.42

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54;
of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Apr. 9	Week	Month	Year	5 Yrs.
	1953	Ago	Ago	Ago	Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del. Philadelphia	4.502	4.502	4.502	4.223	3.355
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del., Philadelphia	4.13	4.13	4.13	3.918	2.965
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.45
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Clayton, Del.	4.35	4.35	4.35	4.15	3.65
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.71
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.95
Strip, H.R., Pitts.	3.975-4.225	3.975-4.225	3.975-4.225	3.75-4.00	3.05
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.65-5.35	3.80
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.71
Wire, Basic, Pitts.	5.475-5.225	5.475-5.225	5.475-5.225	4.25-5.10	3.75
Nails, Wire, Pittsburgh	6.35	6.35	6.35	5.90-6.20	5.20
Tin plate, box, Pittsburgh	\$8.95	\$8.95	\$8.95	\$8.70	\$6.70

SEMITRIMMED

Billets, forging, Pitts. (NT)	\$70.50	\$70.50	\$70.50	\$68.00	\$54.00
Wire rods, 7/8-1", Pitts.	4.425	4.425	4.425	4.10-30	3.175

PIG IRON, Gross Ton

Bessemer, Pitts.	\$55.50	\$55.50	\$55.50	\$53.00	\$40.996
Basic, Valley	54.50	54.50	54.50	52.00	39.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	42.004
No. 2 Fdry, Pitts.	55.00	55.00	55.00	52.50	40.496
No. 2 Fdry, Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry, Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, del. Phila.	59.75	59.75	59.75	57.11	42.504
No. 2 Fdry, Birm.	51.38	51.38	51.38	48.88	37.88
No. 2 Fdry (Birm.) del. Cin.	58.93	58.93	58.93	55.49	42.23
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	55.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	151.00*

* F.O.B. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	\$44.00	\$44.00	\$44.00	\$44.00	\$40.25
No. 1 Heavy Melt, E. Pa.	44.50	44.50	43.00	42.50	39.00
No. 1 Heavy Melt, Chicago	41.50	42.75	42.50	42.50	39.00
No. 1 Heavy Melt, Valley	41.75	44.25	44.25	44.00	40.25
No. 1 Heavy Melt, Cleve.	42.00	44.25	44.25	43.00	39.75
No. 1 Heavy Melt, Buffalo	46.00	47.00	45.50	43.00	43.00
Rails, Rerolling, Chicago	55.00	56.00	53.50	52.50	49.50
No. 1 Cast, Chicago	44.00	44.00	44.00	49.00	69.00

† F.O.B. shipping point.

COKE, Net Ton

Beehive, Furn., Connivsl.	\$14.75	\$14.75	\$14.75	\$14.75	\$12.50
Beehive, Fdry., Connivsl.	17.00	17.00	17.00	17.50	14.875
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	19.25

PIG IRON

F.O.B. furnace prices as reported to STEEL. Minimum delivered price are approximate and do not include 3% federal tax. Key to product companies on pages 184-185.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	\$56.50	\$57.00	\$57.50	\$58.00
New York, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.72

Birmingham District	50.88	51.38	51.38	51.38
Alabama City, Ala. R2	50.88	51.38	51.38	51.38
Birmingham R2	50.88	51.38	51.38	51.38
Birmingham S9	50.88	51.38	51.38	51.38
Woodward, Ala. W15	50.88	51.38	51.38	51.38

Cincinnati, del.	58.93	58.93	58.93	58.93
Buffalo District	54.50	55.00	55.50	55.50
Buffalo R2	54.50	55.00	55.50	55.50
Buffalo H1	54.50	55.00	55.50	55.50
Tonawanda, N.Y. W12	54.50	55.00	55.50	55.50

No. Tonawanda, N.Y. T9	55.00	55.50	55.50	55.50
Boston, del.	65.15	65.65	66.15	66.15
Rochester, N.Y., del.	57.52	58.02	58.52	58.52
Syracuse, N.Y., del.	58.62	59.12	59.62	59.62

Chicago District	54.50	55.00	55.00	55.00
Chicago I-3	54.50	55.00	55.00	55.00
Gary, Ind. U5	54.50	55.00	55.00	55.00
Indiana Harbor, Ind. I-2	54.50	55.00	55.00	55.00
So. Chicago, Ill. W14	54.50	55.00	55.00	55.00

So. Chicago, Ill. Y1	54.50	55.00	55.00	55.00
Milwaukee, del.	56.67	57.17	57.17	57.17
Muskegon, Mich., del.	61.30	61.30	61.30	61.30

Cleveland District	54.50	55.00	55.00	55.00
Cleveland A7	54.50	55.00	55.00	55.00
Cleveland R2	54.50	55.00	55.00	55.00
Akron, O., del. from Cleve.	57.11	57.61	57.61	57.61
Lorain, O. N3	54.50	55.00	55.00	55.00

Duluth I-3	54.50	55.00	55.00	55.00
Erie, Pa. I-3	54.50	55.00	55.00	55.00
Everett, Mass. E1	54.50	55.00	55.00	55.00
Fontana, Calif. K1	60.50	61.00	61.00	61.00
Granite City, Ill. G4	56.40	56.90	57.40	57.40

St. Louis, del. (Ind. tax)	57.15	57.65	58.15	58.15
Ironton, Utah C11	54.50	55.00	55.00	55.00
Geneva, Utah C11	54.50	55.00	55.00	55.00
LoneStar, Tex. L6	50.50	51.00	51.00	51.00
Minnequa, Colo. C10	56.50	57.50	57.50	57.50
Rockwood, Tenn. T3	54.50	55.00	55.00	55.00

Pittsburgh District	55.00	55.00	55.00
<td

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

MARY METALS

Copper: Electrolytic 30.00c-33.00c, Conn. Valley Lake 33.25c, delivered, nom.; foreign electric, del. 32.00c-36.50c.

Ingots: 85-5-5-5 (No. 115) 29.50c; 1-2 (No. 215) 41.75c; 80-10-10 (No. 305) 3c; No. 1 yellow (No. 405) 24.00c.

Prime western 11.00c; brass special 5c, intermediate 11.50c; East St. Louis; grade 12.35c, and special high grade 0c delivered.

Common 12.80c; chemical 12.90c; cor- ing, 12.90c, St. Louis.

Aluminum: 99% plus, ingots 20.50c, 19.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but in excess of rate applicable on 30,000 lb orders.

Aluminum: Piston alloys 24.00-5; No. 12 foundry alloy (No. 2 grade) 23.50c; steel deoxidizing grades, notch granulated or shot: Grade 1, 24.00-26.00c; 2, 23.25-24.50c; grade 3, 22.50-23.50c; 4, 21.50-22.50c.

Aluminum: Commercially pure (99.8%) standard ingots, 10,000 lb and over 27.00c, f.o.b. port, Tex.

Grade A, prompt RFC, 121.50c; outside ket, 110.50c, nom.

Antimony: American 99-99.8% and over but meeting specifications below 34.50c; 99.8% over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c; f.o.b. Laredo, Tex., bulk shipments.

Brass: Electrolytic cathodes, 99.9% base sizes refinery, unpacked, 60.00c; 25-lb pigs, 85c; "XX" nickel shot, 63.85c; "F" nickel or ingots, for addition to cast iron, 60.00c. Prices include import duty.

Barcopper: Open market, spot, New York, \$199.3c per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, \$37.72 per lb contained beryllium, f.o.b. Reading, Pa.

Brass: "Regular" straight or flat forms, del; special or patented shapes \$2.15.

Balt: 97.99%, \$2.40 per lb for 500 lb (kegs); 42 per lb for 100 lb (case); \$2.47 per lb for 100 lb.

Id: U. S. Treasury, \$35 per ounce.

Mer: Open market, New York 85.25c per oz.

Platinum: \$90-\$93 per ounce from refineries.

Platinum: \$23-\$24 per troy ounce.

Platinum: \$175-\$185 per troy ounce.

Tantum (sponge form): \$5 per pound.

OLLED, DRAWN, EXTRUDED PRODUCTS

COPPER AND BRASS

Cents per pound, f.o.b. mill, effective Apr. 1, 1953. Listings are lowest quotations.)

Sheet: Copper 50.48; yellow brass 42.87; commercial bronze, 95% 49.89; 90% 48.76; red brass, 85% 47.11; 80% 45.99; best quality, 43; nickel silver, 18% 59.84; phosphor-bronze grade A, 5%, 70.50.

Rod: Copper, hot-rolled 46.83; cold-drawn 50%; yellow brass free cutting, 36.68; commercial bronze 95% 49.58; 90% 48.45; red brass, 85% 46.80; 80% 45.68.

Seamless Tubing: Copper 50.42; yellow brass 57.5; commercial bronze, 90%, 51.32; red brass, 85%, 49.92.

Wire: Yellow brass 43.16; commercial bronze, 5%, 50.18; 90%, 49.05; red brass, 85%, 7.40; 80%, 46.28; best quality brass, 44.72.

(Base prices, effective Apr. 1, 1953)

Brass Wire: Bare, soft, f.o.b. eastern mills, 30,000 lb lots, 37.46; 30,000 lb lots, 37.55; 30,000 lb lots, 38.08; Weatherproof, 100,000 lb lots, 37.85; 30,000 lb lots, 38.10; l.c.l., 38.60. Magnet wire del., 15,000 lb or more 43.98; l.c.l., 44.68.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Alum- inum	An- timony	Nickel	Silver
Apr. 9	30.00-33.00	12.80	11.00	110.50-121.50	20.50	34.50	60.00	85.25
Apr. 7-8	30.00-33.00	12.80	11.00	116.25-121.50	20.50	34.50	60.00	85.25
Apr. 6	30.00-33.00	13.30	11.00	116.25-121.50	20.50	34.50	60.00	85.25
Apr. 2-4	30.00-34.50	13.30	11.00	116.50-121.50	20.50	34.50	60.00	85.25
Apr. 1	30.00-34.50	13.30	11.00	118.50-121.50	20.50	34.50	60.00	85.25
Mar. 25-31	27.50-34.50	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Mar. 12-24	27.50-34.00	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Mar. 9-11	27.50-33.00	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Mar. 2-6	27.50-32.00	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Feb. 25-28	27.50-28.50	13.30	11.25	121.50	20.50	34.50	60.00	85.25
Feb. 3-24	24.50	13.30	11.50	121.50	20.50	34.50	60.00	85.25
Feb. 2	24.50	13.30	12.00	121.50	20.50	34.50	60.00	85.25
Mar. 1953 Avg.	30.51	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Feb. 1953 Avg.	25.136	13.30	11.431	121.50	20.50	34.50	60.00	85.25
Apr. 1952 Avg.	24.50	18.723	19.50	121.50	19.00	49.077	56.50	85.00

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders, effective Jan. 22, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Widths or Flat Colled Sheet Sheet Collet

Range Diameters Sheet Sheet Base* Base

Inches in. Inc. Base* Base

0.249-0.136 12.48 32.9

0.135-0.096 12.48 33.4

0.095-0.077 12.48 34.1 31.8 36.3

0.078-0.061 12.48 35.0 32.2 36.8

0.060-0.048 12.48 35.5 32.6 37.4

0.047-0.036 12.48 35.9 33.0 37.8

0.037-0.030 12.48 36.5 33.3 38.3

0.029-0.024 12.48 37.1 34.0 39.0

0.023-0.019 12.36 37.9 34.6 39.9

0.018-0.017 12.36 38.7 34.8 39.9

0.018-0.015 12.36 38.8 35.4 41.1

0.014 12.24 38.9 36.4 42.4

0.013-0.012 12.24 40.9 37.1 43.4

0.011 12.24 41.9 38.3 45.0

0.010-0.0095 12.21 43.1 39.4 46.6

0.009-0.0085 12.24 44.3 40.7 48.5

0.008-0.0075 12.24 45.8 41.9 50.3

0.007 12.18 47.3 43.4 52.8

0.006 12.18 48.9 44.8 57.6

* Lengths 72 to 180 inches. ↑ Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) —Round— Hexagonal

across flats 17S-T4 17S-T4

0.125 56.8 ...

0.156-0.188 48.0 ...

0.219-0.313 45.3 ...

0.375 43.7 52.4

0.406 43.7 ...

0.438 43.7 ...

0.469 43.7 ...

0.500 43.7 52.4

0.531 43.7 ...

0.563 43.7 49.2

0.594 43.7 ...

0.625 43.7 49.2

0.688 43.7 49.2

0.750-1.000 42.6 46.4

1.063 42.6 44.8

1.125-1.500 41.0 44.8

1.563 40.5 ...

1.625 39.8 43.2

1.688-2.000 39.8 ...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more \$18.00 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils \$18.00 per cwt, Traps and bends: List prices plus 43%.

ZINC

Sheets 23.00c, f.o.b. mill, 38,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in., 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill, effective Mar. 9, 1953)

Sheets, cold-rolled 36.50c. Strip, cold-rolled 92.50c. Rods and shapes, 82.50c. Plates, 84.50c. Seamless tubes 115.50c.

MONEL

(Base prices f.o.b. mill, effective Mar. 9, 1953)

Sheets, cold-rolled 67.50c. Strip, cold-rolled 70.50c. Rods and shapes, 65.50c. Plates 66.50c. Seamless tubes, 100.50c. Shot and blocks, 57.00c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb 58.00-65.00c; 25 to 99 lb, 48.00-55.00c; 100 lb to 5000 lb, 44.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill)

Sheets, \$15; sheared mill plate, \$12; strip, \$15; wire, \$10; forgings, \$6; hot-rolled and forged bars, \$6.

ALUMINUM

(Base prices f.o.b. mill, effective Mar. 9, 1953)

Sheets, 15c; sheared mill plate, 12c; strip, 15c; wire, 10c; forgings, 6c; hot-rolled and forged bars, 6c.

MAGNESIUM

(Base prices f.o.b. mill, effective Mar. 9, 1953)

Sheets, 15c; sheared mill plate, 12c; strip, 15c; wire, 10c; forgings, 6c; hot-rolled and forged bars, 6c.

TIN

(Base prices f.o.b. mill, effective Mar. 9, 1953)

Sheets, 15c; sheared mill plate, 12c; strip, 15c; wire, 10c; forgings, 6c; hot-rolled and forged bars, 6c.

LEAD

(Base prices f.o.b. mill, effective Mar. 9, 1953)

Sheets, 15c; sheared mill plate, 12c; strip, 15c; wire, 10c; forgings, 6c; hot-rolled and forged bars, 6c.

ZINC

(Base prices f.o.b. mill, effective Mar. 9, 1953)

Sheets, 15c; sheared mill plate, 12c; strip, 15c; wire, 10c; forgings, 6c; hot-rolled and forged bars, 6c.

MONEL

(Base prices f.o.b. mill, effective Mar. 9, 1953)

Sheets, 15c; sheared mill plate, 12c; strip, 15c; wire, 10c; forgings, 6c; hot-rolled and forged bars, 6c.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 42.18c; oval 41.68c.

Nickel Anodes: Rolled, oval, carbonized, carloads 81.00c; 5000 to 29,999 lb, 83.00c; 500 to 4999 lb, 85.00c; 1 to 499 lb, 89.00c, f.o.b. Cleveland.

Nickel Chloride: In 100 lb bags: 10.00 lb and over, 37.00c; 5000 to 9900 lb, 38.00c; 400 to 4999 lb, 40.00c; 300 lb, 42.00c; 200 lb, 43.00c; 100 lb, 45.00c, f.o.b. Cleveland.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers \$1.10 per lb; 100 or 350 lb drums, \$1.00; 1000 lb drums, \$1.05; 2000 lb drums, \$1.15; 4000 lb drums, \$1.20; 5000 lb drums, \$1.25; 10,000 lb drums, \$1.30; 20,000 lb drums, \$1.35; 40,000 lb drums, \$1.40; 80,000 lb drums, \$1.45; 100,000 lb drums, \$1.50; 200,000 lb drums, \$1.55; 400,000 lb drums, \$1.60; 800,000 lb drums, \$1.65; 1,000,000 lb drums, \$1.70; 2,000,000 lb drums, \$1.75; 4,000,000 lb drums, \$1.80; 8,000,000 lb drums, \$1.85; 10,000,000 lb drums, \$1.90; 20,000,000 lb drums, \$1.95; 40,000,000 lb drums, \$2.00; 80,000,000 lb drums, \$2.05; 100,000,000 lb drums, \$2.10; 200,000,000 lb drums, \$2.15; 400,000,000 lb drums, \$2.20; 800,000,000 lb drums, \$2.25; 1,000,000,000 lb drums, \$2.30; 2,000,000,000 lb drums, \$2.35; 4,000,000,000 lb drums, \$2.40; 8,000,000,000 lb drums, \$2.45; 10,000,000,000 lb drums, \$2.50; 20,000,000,000 lb drums, \$2.55; 40,000,000,000 lb drums, \$2.60; 80,000,000,000 lb drums, \$2.65; 100,000,000,000 lb drums, \$2.70; 200,000,000,000 lb drums, \$2.75; 400,000,000,000 lb drums, \$2.80; 800,000,000,000 lb drums, \$2.85; 1,000,000,000,000 lb drums, \$2.90; 2,000,000,000,000 lb drums, \$2.95; 4,000,000,000,000 lb drums, \$3.00; 8,000,000,000,000 lb drums, \$3.05; 10,000,000,000,000 lb drums, \$3.10; 20,000,000,000,000 lb drums, \$3.15; 40,000,000,000,000 lb drums, \$3.20; 80,000,000,000,000 lb drums, \$3.25; 100,000,000,000,000 lb drums, \$3.30; 200,000,000,000,000 lb drums, \$3.35; 400,000,000,000,000 lb drums, \$3.40; 800,000,000,000,000 lb drums, \$3.45; 1,000,000,000,000,000 lb drums, \$3.50; 2,000,000,000,000,000 lb drums, \$3.55; 4,000,000,000,000,000 lb drums, \$3.60; 8,000,000,000,000,000 lb drums, \$3.65; 10,000,000,000,000,000 lb drums, \$3.70; 20,000,000,000,000,000 lb drums, \$3.75; 40,000,000,000,000,000 lb drums, \$3.80; 80,000,000,000,000,000 lb drums, \$3.85; 100,000,000,000,000,000 lb drums, \$3.90; 200,000,000,000,000,000 lb drums, \$3.95; 400,000,000,000,000,000 lb drums, \$4.00; 800,000,000,000,000,000 lb drums, \$4.05; 1,000,000,000,000,000,000 lb drums, \$4.10; 2,000,000,000,000,000,000 lb drums, \$4.15; 4,000,000,000,000,000,000 lb drums, \$4.20; 8,000,000,000,000,000,000 lb drums, \$4.25; 10,000,000,000,000,000,000 lb drums, \$4.30; 20,000,000,000,000,000,000 lb drums, \$4.35; 40,000,000,000,000,000,000 lb drums, \$4.40; 80,000,000,000,000,000,000 lb drums, \$4.45; 100,000,000,000,000,000,000 lb drums, \$4.50; 200,000,000,000,000,000,000 lb drums, \$4.55; 400,000,000,000,000,000,000 lb drums, \$4.60; 800,000,000,000,000,000,000 lb drums, \$4.65; 1,000,000,000,000,000,000 lb drums, \$4.70; 2,000,000,000,000,000,000 lb drums, \$4.75; 4,000,000,000,000,000,000 lb drums, \$4.80; 8,000,000,000,000,000,000 lb drums, \$4.85; 10,000,000,000,000,000,000 lb drums, \$4.90; 20,000,000,000,000,000,000 lb drums, \$4.95; 40,000,000,000,000,000,000 lb drums, \$5.00; 80,000,000,000,000,000,000 lb drums, \$5.05; 100,000,000,000,000,000,000 lb drums, \$5.10; 200,000,000,000,000,000,000 lb drums, \$5.15; 400,000,000,000,000,000,000 lb drums, \$5.20; 800,000,000,000,000,000,000 lb drums, \$5.25; 1,000,000,000,000,000,000 lb drums, \$5.30; 2,000,000,000,000,000,000 lb drums, \$5.35; 4,000,000,000,000,000,000 lb drums, \$5.40; 8,000,000,000,000,000,000 lb drums, \$5.45; 10,000,000,000,000,000,000 lb drums, \$5.50; 20,000,000,000,000,000,000 lb drums, \$5.55; 40,000,000,000,000,000,000 lb drums, \$5.60; 80,000,000,000,000,000,000 lb drums, \$5.65; 100,000,000,000,000,000,000 lb drums, \$5.70; 200,000,000,000,000,000,000 lb drums, \$5.75; 400,000,000,000,000,000,000 lb drums, \$5.80; 800,000,000,000,000,000,000 lb drums, \$5.85; 1,000,000,000,000,000,000 lb drums, \$5.90; 2,000,000,000,00

Improved possibilities of peace in Korea last week precipitated price slides in some of the metals, notably lead, tin and secondary aluminum

CRACKS IN the market structure are beginning to spread with the cold war's spring thaw. They could widen into severe breaks if present trends continue, though there's nothing like panic in the wind.

Peace overtures have had profound effect on the thinking of those dealing with metals. They reason that a less pressing need for defense goods will mean a slowdown in demand for metals. This thinking is translated into hesitant buying and weaker prices in U. S. marts, despite strong and unchecked consumption at record rates.

No Blanket Decline—While signs of deterioration are growing, they refer to individual metals rather than the entire market. One explanation: The inevitable shakeout is being accelerated. Adverse effects are being felt by lead, zinc, tin, and to a lesser degree by copper, secondary aluminum and scrap of all kinds.

Sharpest tumble has come in tin, which dropped over ten cents in less than a week and isn't likely to stop until it's below the dollar mark. Some authorities expect it would keep falling to near its pre-Korea level of 78 cents if RFC buying-selling functions and the stockpile weren't such dominant factors.

Surprise—Lead gave the market a strong jolt. Everyone was looking for steady or even higher prices, but the London Metal Exchange gave a

different cue. When the spread between U. S. and domestic quotations goes above 2 cents, U. S. sellers have to trim sail or risk being swamped by foreign metal.

Last week, with demand on the upgrade, scrap tight and users beginning to believe the time ripe to rebuild inventories, London caution sent prices down. U. S. sellers followed with a half-cent cut to a basis of 13.00 cents, New York. Lead products also dropped by a half-cent. Buyers promptly decided to hold up orders and weather out the storm. Producers remain confident that demand will bring the price back up.

Zinc Wobbly—Zinc is usually sympathetic to lead changes, but prices didn't move immediately. No one will put money on it holding firm, however. Demand is excellent, particularly for high grades, but imports and London shifts have hurt. Prime western is still the key to zinc's price moves; temporary shortages in die casting grades are looked for, but they won't have much effect on the general price level.

Another slight realignment came in copper, where domestic price range narrowed to a 30-33 per cent bracket as a custom smelter sliced 1.5 cents from its quotations. The tin-lead-zinc axis of weakness cut into copper buying too, and users are beginning to play the waiting game. Some foreign copper for May delivery at 32

cents and offers at 33 cents find surprising number of upturned noses. End of allocation control, common knowledge for weeks, was to be announced officially over the weekend. Brass and bronze ingot market is exceptionally soft, with price reduction expected at any time.

Secondary Aluminum Slips

Remelt aluminum ingots are all falling in price as the scrap market softens. Secondary ingots are off 0.5 to 1 cent, scrap 1 to 1.5 cents. Primary aluminum, offerings of quick delivery on foreign ingots and sheets are common, but business isn't as strong as might be expected. Canadian, British, French, Italian and Norwegian mills are reported seeking more business here.

U. S. primary production set February record at 92,649 tons and is at all-time daily high with an average output of 3300 tons, reports the Aluminum Association. The month showed a gain over year-ago figure of 25 per cent in primary, turnover and a significant 39 per cent greater total in sheet and plate shipments.

Nippon Nickel Available

If you're hard up for nickel—as who isn't these days—here's a bit of good news for a change. Over 50 metric tons of Japanese metal is in the market now, and it can be used without charging against allocation. NPA points out that end-use control will apply to any metal bought. Shipments came from New Caledonia via Japan.

Magnesium Plates Offered

Commercial magnesium plates weighing 190 pounds are being offered by Brooks & Perkins Inc., Detroit, with 10-week delivery from Livonia, Mich., mill. Hot-rolled AZ 31 alloy, plates measuring 0.25 x 60 x 186 in. were displayed by the company at the International Magnesium exposition in Washington. Base price on widths to 48 in. is 19 cents, with quantity, shearing and packing extras added. Typical physicals are: Ultimate tensile strength 30,000 psi, tensile yield strength 18,000 psi, elongation 16 per cent in 2-in. Plate from 1 to 3/16 in. is rolled from 4-in. slabs in one heat. Cast slab weighing 300 pounds is rolled as it comes from mold. Finished slab after heating and scalping is 20 pounds.



Magnesium Body for a Featherweight Ride

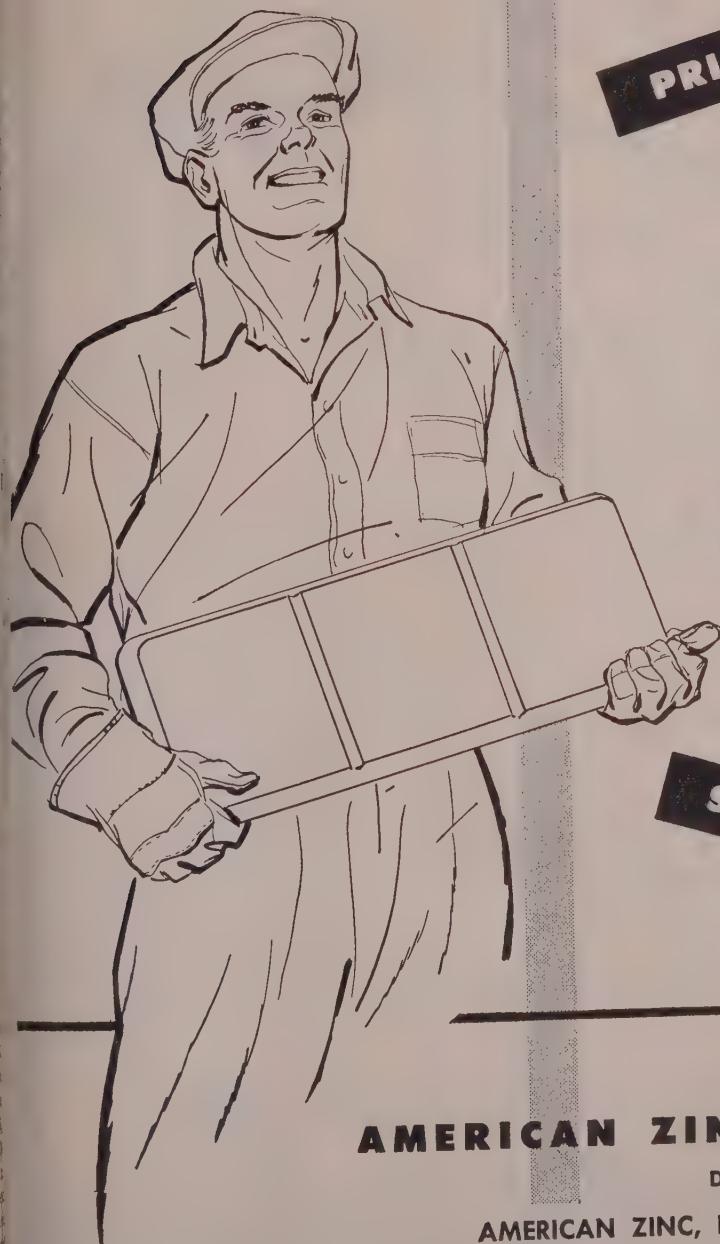
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= 63.00 lbs. (theoretical)



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When sheets are ordered by gauge number, the permissible A. I. S. I. variation in thickness is plus or minus 10%. Thus, if you order 18 gauge, you may receive sheets .052" thick, when a thickness of .0475" would suit your purpose. Using a standard 18 gauge 36" x 120" sheet as an example,

the theoretical weight is 63.00 pounds, but the weight could permissibly vary between 59.2 pounds and 65.52 pounds. Each .001" of thickness adds 1.26 pounds per sheet.

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CORPORATION
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Sheetmakers Booking for Third Quarter

Expected substantial carryovers from second quarter seen limiting new business. Producers accepting commitments cautiously, some on month-to-month basis

Sheet and Strip Prices, Page 169 & 172

Philadelphia — Sheet demand continues at high pitch. This applies to major grades except galvanized, which includes some of the minor ones, such as electrical sheets, annealing stock and stainless. Most are booking some tonnage for third quarter in addition to high-level government work.

Cleveland — Although sheetmakers have opened their books for third quarter some will not have much in tonnage to offer customers for this period. From all indications carryover orders from second quarter will be heavy and expectations are, based on current demand pressure, overflow from third to fourth quarter will be similarly large. This promises to be the case especially with the larger producers. Should the continuous mills be relieved of the burden of producing light plates, seen as an early possibility, some relief in sheet supply will be afforded, it will provide only a partial solution. Automotive and appliance demand is outstanding, but all lines of consumption are figuring actively in the current pressure on the market.

Boston — Silicon sheets notably cold-rolled in coils, will be in limited supply for July. Current tentative schedules for carbon sheets next quarter also point to some reductions in allocations, notably if automotive buying holds up. Major shortage in cold-rolled sheets is due chiefly to heavy buying for automotive account, including parts suppliers. Most producers want to clean up CMP tonnage by June 30. If successful, some open or marginal tonnage will go into next quarter. Allotments to converters, strip in this area, continue beyond June 30.

New York — Sheet sellers are extending commitments now that most of them have opened books for third quarter or for at least the first month of the period. Those who have opened beyond July, however, have only extended their commitments lightly, as carryovers, especially in the hot and cold grades, are expected to be substantial. One producer says his carryover may account for between two or three weeks production of hot and cold-rolled sheets.

Cincinnati — Pipelines to the household appliance industry show some signs of filling up, but there are no indications that buyers want to hold back on orders. Some mills report their books are closed for third quarter. Those still working on third quarter allotments will have a carry-over of orders from second quarter. Manufacturers are endeavoring to place more conversion business. Mills are reported about 60 days behind on commitments.

Chicago — Nothing in the sheet picture as yet gives indication of lessening demand in the last half of the year. Mills are about to notify civilian goods manufacturers as to their third quarter quotas and it is a

Tubular Goods . . .

Tubular Goods Prices, Page 173

Pittsburgh — Should plastic pipe ever find a market that represents a big threat to steel, producers in this district will be surprised. Steel pipe producers are keeping an eye on developments (U. S. Steel has installed a small extrusion press at McKeesport for experimental purposes), and they agree there is a market for plastic pipe. The possibility of plastic coated steel pipe is being investigated and steel producers hope it will be the answer to any threatening competition from plastic pipe.

Boston — Prices on butt-weld steel pipe at the distributor level have eased further. Stocks of this grade are balanced and more jobbers are not taking full allotments. Increased difficulty also is experienced in directing turned-down allocations into direct shipments. Light-walled welded tubing also is soft, but in stainless grades is active.

Philadelphia — Butt-weld pipe stocks are building up. Distributors are not cancelling their regular mill quotas, but they are in some cases easing discounts in an effort to move tonnage.

Los Angeles — Trade observers forecast tighter supply of oil country tubular goods in third quarter and balance between supply and demand by fourth quarter.

Seattle — Demand for pipe is improving. Several sizable projects involving both cast iron and steel pipe are up for bids. Cast iron pipe deliveries are normal, but as a rule buyers ask for alternative bids. Cast iron pipe awards in one recent week exceeded 500 tons, and 800 tons are involved in bids closing later this month. Walla Walla, Wash., is asking figures on a large steel water pipe tonnage.

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foregone conclusion that many people are going to be made unhappy over the fact that tonnages will show little if any improvement over second quarter.

St. Louis — Galvanized sheets continue in softer demand, and mills are beginning to doubt the lag is wholly seasonal. Farm building is not registering its usual volume pickup. Cold-rolled sheet output is down, due to a shift over to new slab mill equipment at Granite City Steel Co.

Industrial Fastener Prices Are Increased

(Bolt and Nut Prices, Page 173, are those in effect prior to latest changes)

New York — Bolt, nut and rivet prices are being advanced 2 to 3 per cent on the average. Some long bolts are being increased around 6 per cent. Even with this increase, some producers still are absorbing about 50 per cent of their cost increases since January 1951, which since then are up about 10 per cent. The last increase in fastener prices was on Nov. 12, 1952, a rise of 2.2 per cent effected by way of a pass-through permitted by OPS and based on the lowest estimate of raw material cost increases in the industry, not including labor. One maker estimates its labor costs are up as much as 32 cents an hour since early 1951.

Cleveland — General price increase averaging 2 to 4.5 per cent is impending on some industrial fasteners. One large Pittsburgh producer of bolts and nuts increased prices effective Apr. 7, and other makers indicated they planned to issue new schedules shortly. A Cleveland rivet maker increased its prices on large and small rivets, effective Apr. 3, now

quoting large rivets \$8.50 per 100 pounds, and small rivets at 30 per cent of list.

The increase in prices is effected to offset higher wage and other costs which were not covered by the increases permitted last fall by the Office of Price Stabilization to offset increased steel costs. In the case of one bolt and nut maker here it just completed a new wage agreement which grants its workers another 7½ cents per hour increase.

Current demand for fasteners is strong. First quarter volume was heavy, but due to high costs and frozen prices profit margins were slim. Steel supply continues tight though improved over that several months back.

Pittsburgh — Prices are being increased on bolts and nuts by producers here. Meanwhile, an anticipated stronger demand has not yet developed. Customers are not showing much interest in long term commitments. General agreement seems to be that sentiment has been softened by speculation on the Korean truce.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 1 cent; Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Baltimore	5.81	7.17	8.27	6.42	...	6.41	7.18	11.27	6.47	6.47	7.70
Boston	6.51	7.35	8.39	6.55	...	6.42	7.49	12.37	6.56	6.80	7.94
Buffalo	5.80	6.65	8.31	6.21	...	5.90	6.95	11.07	6.08	6.30	7.67
Birmingham ...	5.80	6.65	7.70‡	5.80	...	5.80	7.85	...	5.95	6.10	8.15
Chicago	5.80	6.65	7.90	5.83	...	5.83	6.80	10.65	5.95	6.00	7.18
Cincinnati	6.13	6.72	8.21	6.14	...	6.13	7.16	10.97	6.42	6.47	7.60
Cleveland	5.80	6.65	8.04	6.00	...	5.89	6.90	10.79	6.28	6.17	7.51
Detroit	6.23	6.46	8.44	6.08	7.495	6.12	7.10	10.92	6.42	6.47	7.52
Houston	6.74	...	8.67	6.89	...	6.98	...	...	6.82	6.78	8.18
Jersey City, N.J.	6.26	7.27	8.32	6.56	...	6.59	7.53	9.54	6.39	6.60	8.01
Los Angeles ...	6.60	8.45	9.50	6.75	11.20	6.60	8.65	12.05	6.60	6.70	8.90
Milwaukee	5.97	6.82	8.07	6.00	...	6.00	7.07	10.82	6.12	6.17	7.35
Moline, Ill.	6.16	7.00	8.30	6.19	...	6.18	6.91	...	6.30	6.30	...
New York	6.28	7.37	8.32	6.56	...	6.69	7.63	11.14	6.49	6.70	8.11
Norfolk, Va.	7.60	...	...	...	...	6.44	8.70	...	7.25	6.64	7.33
Philadelphia ...	6.16	7.18	7.70	6.50	8.30	6.47	7.50	10.89	6.22	6.29	7.42
Pittsburgh	5.80	6.65	7.90	5.97	...	5.83	6.90	10.65	5.95	6.00	7.18
Portland, Oreg.	7.80	9.05	9.75	7.60	...	7.35	9.40	...	7.30	7.30	9.25
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.63	...	6.58	6.88	7.80
St. Louis	6.10	6.94	8.20	6.14	...	6.13	7.20	10.95	6.35	6.35	7.58
St. Paul	6.47	7.31	8.61	6.50	...	6.49	7.32	...	6.61	6.61	7.84
San Francisco.	6.85	8.15	9.45	6.70	...	6.60	8.65	12.00	6.45	6.70	8.81
Seattle-Tacoma.	7.36	8.24	9.40	7.40	...	7.08	9.37	12.00	6.83	7.19	9.10
Spokane (city).	7.80	9.40	10.15	7.15	...	7.10	9.70	11.90	7.00	7.10	9.15
Washington	6.31	7.61	8.90	6.89	...	6.90	8.03	...	6.93	6.95	8.17

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (a extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; || as annealed. Base quantities, 2000 to 9999 lb except as noted. C-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ‡—500 to 1499 lb; ||—1000 to 1999 lb.

Semifinished Steel . . .

Semifinished Prices, Page 168

Pittsburgh—Approximately 100,000 tons of steel ingots were lost by the short-lived strike of Union railroad workers that tied up four plants of U. S. Steel Corp. as well as coal mining operations to the tune of 90,000 tons, and some metalworking industries. Some observers think the loss may cut into plate and structural deliveries. Other producers here feel the loss will be spread out over a greater number of products with the result no one will feel too great a pinch.

Youngstown—U. S. Steel Corp.'s Ohio works and McDonald mills here started closing down last midweek due to a strike of 100 employees of the Youngstown & Northern railroad, a subsidiary serving these plants. Expectations were the shutdown would idle about 10,000 workers and cut off output of about 8000 tons of ingots daily.

Warehouse . . .

Warehouse Prices, Page 154

Pittsburgh—Warehousemen are not complaining about overstocked shelves but they are finding customers are getting more particular. Buying of tighter items, such as bars, shapes and structural, is less aggressive.

Cleveland—Seasonal upswing in demand for the general run of steel products is being reflected in orders coming to district warehouses. Automotive and appliance industry needs figure prominently, but building steel is moving more actively than during the winter months.

Distributors' stocks continue to rise, though they are still unbalanced, chiefly in heavy bars and heavy

plates. Loss of production in Pittsburgh recently due to a strike of railroad workers has slowed down warehouse tonnage receipts from that point, but in general incoming shipments have been pretty much on schedule.

Boston—Warehouses with historical relationships with the mills will have to depend on volume from those sources for second quarter. Mill allocations are out after June except for the higher rated military orders against which warehouses can order replacements under priority.

Philadelphia—Warehouse trading this month has started off well. Business will be sustained at the record rate for this year established in March. Inventories are improving.

Baltimore—Warehouses report brisk business, March being the most active month to date this year. Equally good business is expected this month. Inventories are improving, and while still unbalanced, consumers usually can get what they want by shopping around.

Cincinnati—Mill shipments to warehouses are lagging from two to four months. Some orders dated back to last year are expected to be filled this month. March business matched that of the previous month. Demand for hot and cold-rolled sheets, large rounds and tubular goods remains firm. Stocks are out of balance and there is no immediate chance of catching up on sizes and volume shortages.

Chicago—Except for galvanized sheets, which continue easy, steel warehouses here find no convincing developments that supply-demand balance is near at hand. Consumers press hard for all of the products in short supply, such as sheets, bars and plates.

Los Angeles—More steel is on

warehouse shelves but distributor inventories lack popular sizes of hot-rolled and cold-rolled sheets, plates, wide flange beams, and shapes.

Seattle—Warehouse executives expect prices will round off on a supply and demand basis. Under government control bidding was difficult with price changes effective the tenth of each month. As an illustration, bars have fluctuated between 7.40 cents and 7.08 cents. The price now is expected to be stabilized at a mean of the two. The sale averaging is expected on other items. Demand currently is spotty and while seasonally active is off slightly from a year ago. Some Alaska public work jobs have been canceled. Items rolled by Pacific Coast mills are in good supply but eastern products continue tight, especially hot-rolled sheets and wide plates. Supply of galvanized sheets is described ample.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 168 & 169

Chicago—Demand for reinforcing steel exceeds output, still no job being held back for lack of material. Prospects are for a heavy volume road construction in Illinois and Indiana in late spring and summer, which, coupled with a substantial amount of industrial construction, will require barmakers to distribute steel on a quota basis as in the past. Welded fabric is not nearly so tight as bars.

Seattle—Rolling mills here are operating at capacity. While order backlog were reduced in first quarter, prospects are promising for second quarter as many major projects involving reinforcing bars are expected.

(Turn to page 156)



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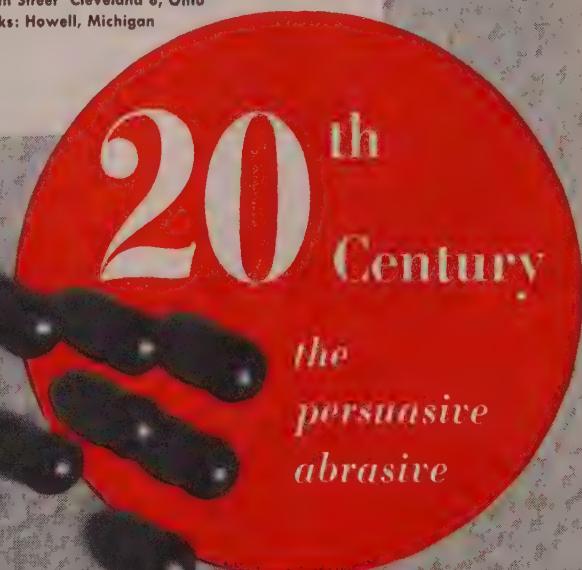
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Reinforcing Bars . . .

(Continued from page 154)

to be placed soon. Small tonnage inquiries for schools, industrial plants and private construction work are increasing. State highway projects and reclamation requirements will absorb large quantities of bars. Several federal projects have been redesigned, reducing the amount of steel required. A family housing contract at Elmen-dorf Field, for instance, was awarded on the basis of block walls instead of reinforced concrete.

Los Angeles—California state's proposed 4800-mile highway and freeway construction program costing over \$2 billion, under consideration by California State Senate, would almost double current programs.

Structural Shapes . . .

Structural Shape Prices, Page 163

New York—Public work, especially state bridge construction, overshadows all other activity in the local structural market. No sizable jobs have been placed within the last few days, but a number are active, with awards anticipated later this month.

New York—Competition continues strong among smaller fabricators, especially those whose backlog are not sufficiently extended to give them efficient operation.

Boston—Slow seasonal start in bridge estimating, is partially offset by more building. Including the Bangor-Brewer, Me., span, less than 2500 tons of bridge tonnage is actively on the boards and this also includes 500 tons for a riveted plate girder, Norwich, Conn.

Philadelphia—The Pennsylvania Highway Department has entered the market for structural bridgework for the first time this year. Inquiry includes 1500 tons for a project in York county, bids opening Apr. 24. Bids for two other projects, each involving less than 100 tons, will be opened at that time.

Pittsburgh—Demand from railroad car builders has subsided considerably from the peak of a month ago, but their place has been taken by smaller structural fabricators. Many small building projects in the Pittsburgh district have been waiting for structural material.

Cleveland—Structural fabricators report a seasonal upswing in building activity with resulting heavier demand for structural and other building steel items. This first became noticeable in March following a relatively quiet February. Currently, public jobs, such as schools, feature but small industrial work also is before the trade.

Baltimore—Except for the 4000-ton bridge in Washington for the District of Columbia Commission, on which bids closed Apr. 9, no outstanding structural work is being figured in this district. Nevertheless, considerable small work of miscellaneous character is keeping local fabricating shops active. Some fabricators have order backlog of six months or more.

Birmingham—Ingalls Iron Works Co. has booked a contract for 5500 tons of structural for the 22-story southeastern regional office of the

(Turn to page 159)

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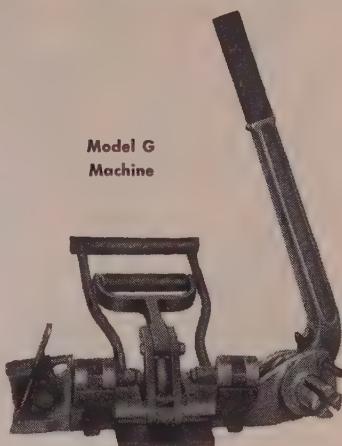
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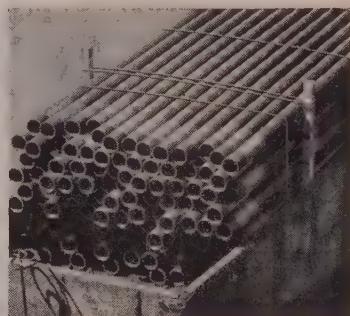
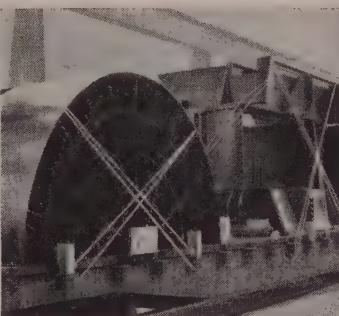
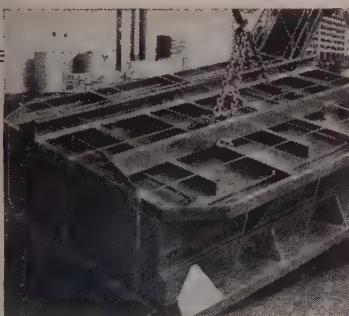
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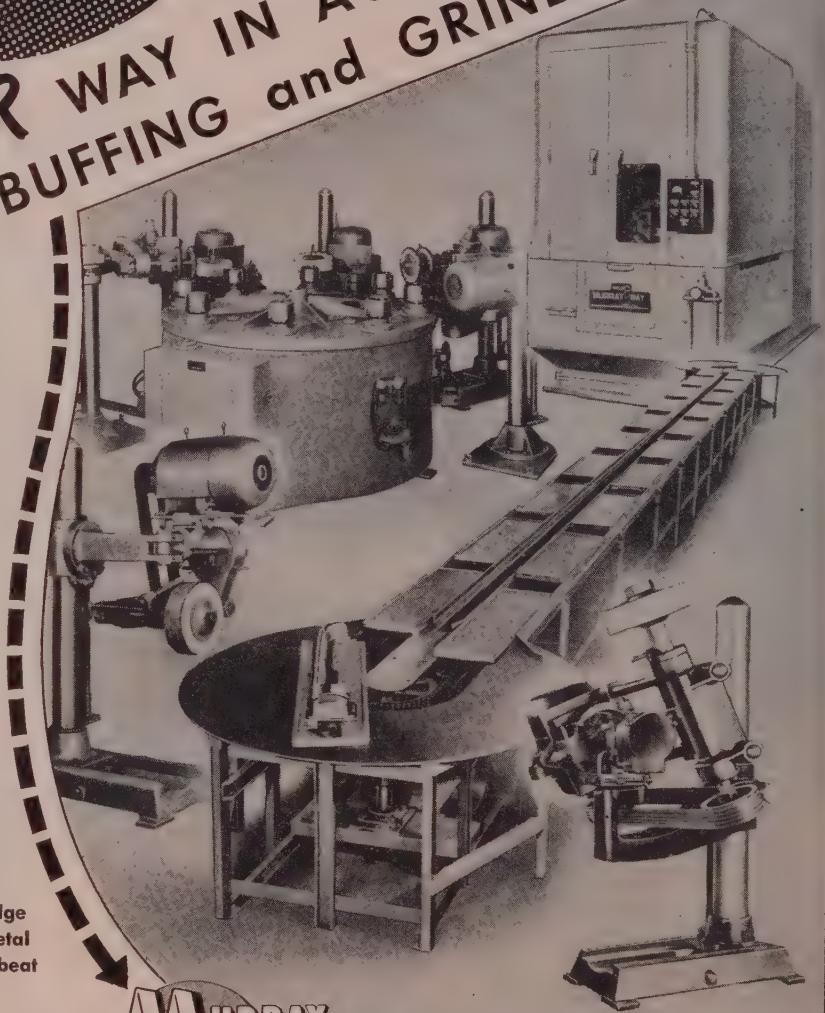
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Structural Shapes . . .

(Continued from page 156)

Prudential Insurance Co. of America at Jacksonville, Fla. The order represents \$1.5 million. The steel will be fabricated here and erected by the Steel Construction Co., an Ingalls affiliate.

Los Angeles—Demand for structural, sustained by active hospital construction, is stronger. Construction of the \$3 million Mount Sinai hospital will start May 1. Construction is underway on the \$2 million Daniel Freeman Memorial hospital in Inglewood.

Seattle—Largest structural job ending here involves 3000 tons plus for the proposed Anaconda Aluminum Co. reduction plant at Flathead, Mont. Pacific Car & Foundry Co. last week booked 2400 tons for the Washington state Chehalis river bridge. Local plants were idle recently due to a labor dispute. Demand for shapes indicates an active second quarter.

Steel Bars . . .

Bar Prices, Page 168 & 169

Boston—Lower mill allotments to commercial consumers for third quarter are due in some instances to the fact producers will fail to meet higher second quarter goals. Substantial carryovers are already a problem in lining up April-June tonnage. Books are open for third quarter on alloys and carbon, and on a month-to-month basis are filling up for July, tonnage being limited in the larger sizes to what is left after carryovers and set-aside military tonnage. Except for cold-finished, this volume will be small.

New York—The leading producer has been delayed by recent labor difficulties at Pittsburgh, but commercial bar producers generally have opened books for shipment beyond second quarter.

Philadelphia—Most carbon bar producers have opened books for tonnage shipment beyond the current quarter, but they are doing so conservatively.

Pittsburgh—Demand continues to taper for small diameter bars, but there is every indication of tight supply in the large diameters through third quarter. Latest estimates place the increase in defense tonnage for the shell program at 30 per cent. No cutback is expected in event of a Korean war truce.

Cleveland—Barmakers have opened books for third quarter tonnage but they are taking new business conservatively. Actually, heavy carryover is expected from second to third quarter with the result not much relief in tight supply conditions is indicated in the latter period.

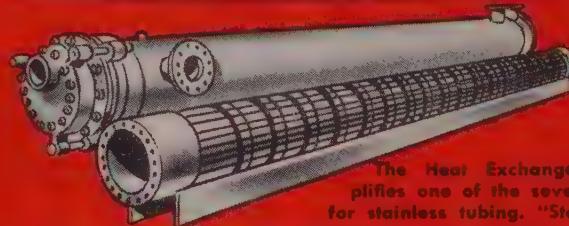
Cincinnati—Heat-treated or annealed bars are the biggest bottleneck now. Large diameter bars are in tight supply. Other types have loosened a little. Altogether, the alloy bar situation is not too bad. The inventory position in this line has improved a bit. Carbon bars appear to be making no headway with business holding up and no increase in inventories.

Baltimore—Manufacturers of light

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machinery tools and fasteners are continuing to press for bar tonnage. One large maker of portable electric tools reports heavy demand for domestic tool kits, a trend that has been appreciably growing over the past two years, as householders turn increasingly toward doing their own repairs and making minor alterations wherever possible.

Chicago—This week and next civilian bar users will learn from the mills what quotas they will be allowed for third quarter. The news will not be good. Military uses account for over 20 per cent of bar production and the remainder is not enough to match demand from every consuming area.

Plates . . .

Plate Prices, Page 168

Cleveland—Heavy gage plates continue in strong demand with consumers still unable to satisfy all their requirements. Warehouse buyers report heavy plates among the chief items in short supply. On the other hand, light gage plates are steadily increasing in availability and shortages in this particular category are considered temporary. How long this improvement in light plate supply will be in evidence is questionable, however. Some trade authorities think that supply will tighten quickly should the continuous mills now rolling light gage plates reduce their output to a minimum in favor of sheets after government distribution controls, except for military and

atomic energy needs, are lifted beginning third quarter.

Pittsburgh—For the length of time it is out of production, the No. 3 open-hearth shop of U.S. Steel Corp. will have a tightening effect on tonnage available in the Pittsburgh district. Largest portion of the tonnage from this works goes into production of heavy plates and structurals. Plate producers are not looking for customers but they would like assurance of a solid market in fourth quarter.

Boston—Procurement for three yards constructing warships, destroyers and submarines has stepped up with some tonnage coming from as far away as southern mills. Producers who opened books for July now are closed out for that month, except for narrow and thin sizes. Straight chromium clad deliveries average eight weeks and nickel-bearing four to five months.

New York—Plate producers are encouraged over the outlook for third quarter. Most sellers believe volume will continue to tax facilities.

Philadelphia—Plate producers are moving conservatively in accepting tonnage for third quarter. Some have opened books for the entire quarter, but others have not opened beyond July. Carryovers must be appraised more accurately and a better idea obtained as to what their rated tonnages are going to amount to.

Seattle—Sizable plate tonnages are involved in a number of air field fuel storage projects in this area and Alaska. These are scheduled for

(Turn to page 162)

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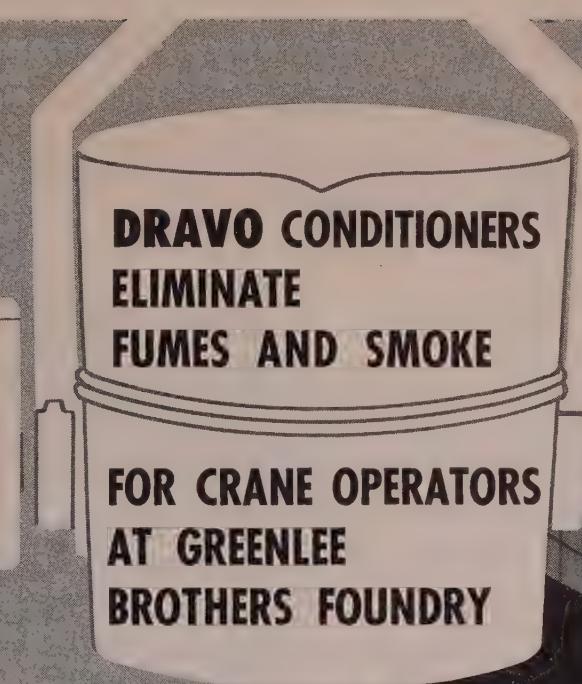


Above: For charging blast furnace.

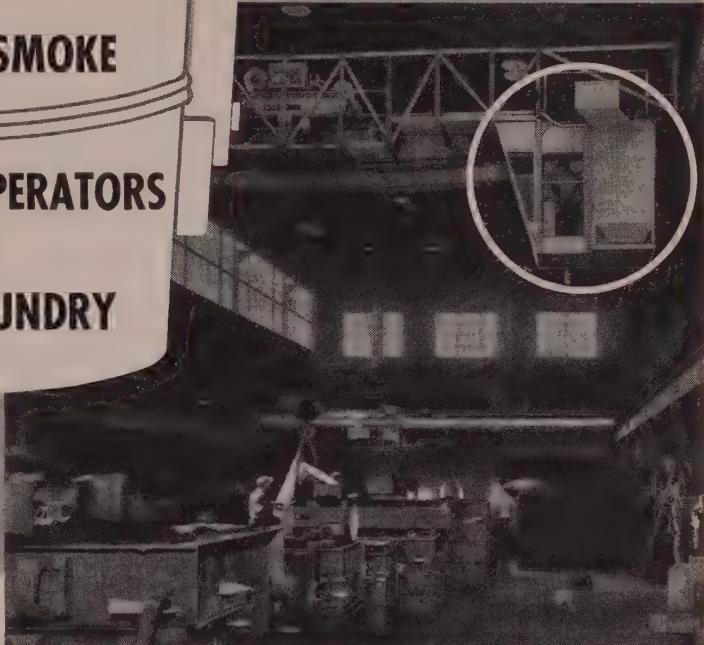
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Plates . . .

(Continued from page 160)

early action. Major construction jobs involving plates include a pulp plant under construction at Ward Cove, Alaska, the Scott Paper Co. expansion at Everett, Wash., and an oil refinery installation at Ferndale, Wash., bids in. Also a proposed refinery project at Tacoma is expected to develop shortly.

Tool Steel . . .

Tool Steel Prices, Page 172

New York — Shipments of high speed and tool steel, excluding hollow drill steel, increased in February, according to the American Iron & Steel Institute. Total shipments during the month were 10,046 tons, comparing with 9769 tons in January. In February a year ago shipments were 13,533 tons. In the first two months of this year shipments amounted to 19,815 net tons, a sharp decline compared with the 28,016 tons shipped in the like period of 1952.

Philadelphia — An eastern producer of mine and quarry steel has advanced prices on most grades, effective Apr. 2. Carbon hollow drill was increased to 18.50 cents, base; alloy hollow drill to 21.50 cents; carbon broaching to 14.50 cents; and channeled steel to 14.50 cents. These new prices represent increases of 2 cents in each case. Auger twisted steel was boosted to 32 cents, up 3 cents. Solid drill steel is unchanged at 12 cents.

Wire . . .

Wire Prices, Page 172

Baltimore — Manufacturers wire continues in active demand. In addition, some improvement is noted in merchant wire products trade. Fencing is beginning to move more briskly along with other products required in the farming areas. An interesting trend in the Carolinas is an increase in cattle raising. This movement over recent years has spread from the West and Southwest to the Southeastern states. Florida now is a highly important cattle raising state, and South Carolina and North Carolina are steadily rising in importance in the field.

Boston — Producers of unthreaded cold-headed specialties, 5/16 inch and under, small rivets, including tubular, have converted into orders second quarter tickets, but find the supply of processed wire, mostly in low carbon grades, improving. Deliveries on finished specialties entering into a broad line of consumer goods are 10 to 12 weeks.

New York — Heavy buying by the automobile industry features wire demand, notably valve spring grade. Incoming orders are in excess of shipments which are up. Industrial use of wire specialties is brisk with demand heavier for music wire in formed springs. Second quarter schedules are filled with only scattered openings for unallocated tonnage.

Pittsburgh — Few signs of increased demand for merchant wire products

(Turn to page 167)



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32-35% Lanthanum

22-25% Neodymium

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0.5 to 1.5% Max. Iron

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Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, \$85, Palmerton, Pa.; \$85, Pittsburgh and Chicago; (16% to 19% Mn) \$1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk \$225 per gross ton of alloy, c.l. packed \$237; gross ton lots, packed, \$252; less gross ton lots, packed \$269; f.o.b. Sheridan, Pa., Alloy, W. Va., Niagara Falls, N. Y., Ashtabula, Philo or Marietta, O., Lynchburg, Va. Base price: \$227, Johnstown, Pa.; \$228, Etna, Pa.; \$226, Anaconda, Mont. Shipment from Pacific Coast warehouses by one seller, add \$33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots \$267; less gross ton lots, \$284, f.o.b. Chicago. Add or subtract \$2.50 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95¢ per lb of contained Mn, carload packed 28.7¢, ton lots 29.8¢, less ton 31.0¢. Delivered. Deduct 0.5¢ for max. 0.15% C grade from above prices, 1¢ for max. 0.30% C, 1.5¢ for max. 0.50% C, and 4.5¢ for max. 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 0.5¢ to the above prices. Spot, add 0.25¢.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk, 21.35¢ per lb of contained Mn, carload packed 22.1¢, ton lot 23.2¢, less ton 24.4¢. Delivered. Spot, add 0.25¢.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2¢ per lb of metal; packed, 36.95¢; ton lot 38.45¢; less ton lots 40.45¢. Delivered. Spot, add 2¢.

Electromanganese: Carload, 30¢; ton lots, 32¢; 250 to 1999 lb, 34¢. Premium for hydrogen-removed metal, 1.5¢ per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4¢ per lb of alloy, carload packed 12.15¢, ton lots 13.05¢, less ton 14.05¢. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2¢ from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5¢ from above prices. Spot, add 0.25¢.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, \$1.50 per lb of contained Ti; less ton \$1.55. (Ti 35-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots \$1.35, less ton \$1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5¢.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract \$177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract, \$195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75¢ per lb of contained Cr; c.l. packed 25.65¢, ton lot 28.20¢, less ton 28.20¢. Delivered. Spot, add 0.25¢.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.03% C 37.00¢ per lb of contained Cr, 0.04% C 35.50¢, 0.06% C 34.50¢, 0.10% C 34.00¢, 0.15% C 33.75¢, 0.20% C 33.50¢, 0.50% C 33.25¢, 1% C 33.00¢, 1.50% C 32.85¢, 2% C 32.75¢. Carload packed add 1.1¢, ton lot add 2.2¢, less ton add 3.9¢. Delivered. Spot, add 0.25¢.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. 8 M x D, bulk, 26.25¢ per lb of contained Cr. C.l. packed 27.15¢, ton 28.50¢, less ton 30.25¢. Delivered. Spot, add 0.25¢.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 23-32%, C 1.25% max.) Contract, carload, packed 8 M x D, 18.35¢ per lb of alloy; ton lot 19.2¢; less ton lot, 20.4¢, delivered; spot, add 0.25¢.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75¢ per lb of contained chromium plus 12.4¢ per pound of contained silicon; 1" x down, bulk 25.90¢ per pound of contained chromium plus 12.60¢ per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 25.75¢ per lb of contained silicon plus 16.4¢ per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract carload, 1" x D; packed, max. 0.50% C grade, \$1.12 per lb of contained chromium, ton lots \$1.14, less ton \$1.16. Delivered. Spot, add 5¢; prices on 0.10 per cent carbon grade, up 4¢.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.00¢ per lb of alloy, carload packed 20.8¢, ton lot 22.3¢, less ton 23.3¢. Delivered. Spot add 0.25¢.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0¢ per lb of alloy, carload packed 20.2¢, ton lot 22.1¢, less ton 23.6¢. Deld. Spot add 0.25¢.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0¢ per lb of contained Si, packed 21.40¢; ton lot 22.50¢, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40¢ per lb of contained Si, carload packed 14.0¢, ton lot 15.45¢, less ton 17.1¢. Delivered. Spot, add 0.45¢.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3¢ to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3¢ per lb of contained Si, carload packed 15.8¢, ton lot 16.75¢, less ton 18.0¢. Delivered. Spot, add 0.8¢.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0¢ per lb of contained Si, carload packed 18.2¢, ton lot 19.15¢, less ton 20.2¢. Delivered. Spot, add 0.25¢.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5¢ per lb of Si, c.l. packed 19.7¢, ton lot 20.6¢, less ton 21.6¢. Add 0.5¢ for max. 0.10% calcium grade. Deduct 0.5¢ for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25¢.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90¢ per lb of alloy, ton lots packed 11.30¢, 20 to 1999 lb 11.65¢, smaller lots 12.15¢.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.) Contract, c.l. lump, bulk 7.0¢ per lb of alloy, c.l. packed 7.75¢, ton lot 8.5¢, less ton 9.35¢. Delivered. Spot, add 0.25¢.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.) Contract, carload, lump, packed 20.25¢ per lb of alloy, ton lot 21¢, less ton 22.25¢. Freight allowed. Spot add 0.25¢.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max.) Contract, any quantity, \$3.10 per lb of contained V. Delivered. Spot, add 10¢. Crucible-Special Grades (V 35-55%, Si 2-3.5% max, C 0.5-1% max), \$3.20. **Primes and High Speed Grades:** (V 35-55%, Si 1.50% max, C 0.20% max) \$3.30.

Grainal: Vanadium Grainal No. 1, \$1 per lb; No. 6, 68¢; No. 79, 50¢, freight allowed.

Vanadium Oxide: Contract, less carload lots \$1.28 per lb contained V_2O_5 , freight allowed. Spot, add 5¢.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%), 10,000 lb W or more, \$4.85 per lb of contained W; 2000 lb W to 10,000 lb W, \$4.95; less than 2000 lb W, \$5.07, f.o.b. Niagara Falls, N. Y.

*Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y., basis.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max.) Contract, 100 lb or more, 1" x D, \$1.20 per lb of alloy. Less than 100 lb \$1.30. Delivered, spot, add 5¢. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75¢ per pound; Grade B (14-18% B) \$1.20; Grade C (19% min B) \$1.50.

Borosil: (3 to 4% B, 40 to 45% Si), \$5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45¢ per lb; smaller lots, 50¢ per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50¢ per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3 1/2 lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50¢ per lb of briquet, carload packed 15.2¢, ton 16.0¢, less ton 16.9¢. Deld. Add 0.25¢ for notching. Spot, add 0.25¢.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45¢ per lb of briquet, c.l. packaged 13.25¢, ton lot 14.05¢, less ton 14.95¢. Delivered. Add 0.25¢ for notching. Spot, add 0.25¢.

Silicomanganese Briquets: (Weighing approx. 3 1/2 lb and containing exactly 2 lb of Mn and approx. 1/2 lb of Si). Contract, c.l. bulk 12.65¢, per lb of briquet, c.l. packed 13.45¢, ton lot 14.25¢, less ton 15.15¢. Delivered. Add 0.25¢ for notching. Spot, add 0.25¢.

Silicon Briquets: (Large size — weighing approx. 3 1/2 lb and containing exactly 2 lb of Si). Contract, carload, bulk 8.95¢ per lb of briquet, c.l. packed 7.75¢, ton lot 8.85¢, less ton 9.45¢. Delivered. Spot, add 0.25¢. (Small size—weighing approx. 2 1/2 lb and containing exactly 1 lb of Si). Carload, bulk 7.1¢, c.l. packed 7.9¢, ton lot 8.7¢, less ton 9.6¢. Delivered. Add 0.25¢ for notching, small size only. Spot, add 0.25¢.

Molybdc-Oxide Briquets: (Containing 2 1/2 lb of Mo each) \$1.14 per pound of Mo contained, f.o.b. Langloeth, Pa.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max.) Contract, ton lot, 2" x D, \$4.95 per lb of contained Cb, less ton \$4.95. Delivered. Spot, add 10¢.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb 60% min, C 0.30% max) ton lots, 2" x D, \$3.75 per lb of contained Cb plus Ta; less ton lots 3.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45¢ per lb of alloy, ton lot 47¢, less ton lot 49¢. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.) Contract, carload, packed, 1/2" x 12 M, 17.5¢ per lb of alloy, ton lots 18.25¢, less ton 19.5¢. Deld. Spot, add 0.25¢.

Graphidox No. 4: (Si 48-52%, C 5-7%, Ti 9-11%), c.l. packed, 18¢ per lb of alloy; ton lots 19¢; less ton lots 20.5¢, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15¢ per lb of alloy; ton lots 16.50¢; less ton lots 17.75¢, f.o.b. Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50¢, packed 15.50¢; less ton lots, 15.75¢; less ton lots, packed, 16.25¢ per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of \$3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, S. C.; Washington, Pa., furnace, any quantity \$1.32.

Ferromolybdenum: (55-75%). Per lb, contained Mo f.o.b. Langloeth, \$1.32 in all sizes except powdered which is \$1.41; Washington, Pa., furnace, any quantity \$1.32.

Technical Molybdc-Oxide: Per lb, contained Mo, f.o.b. Langloeth, Pa., \$1.14, in cans; in bags, \$1.13, f.o.b. Langloeth, Pa.; Washington, Pa., \$1.13.

They

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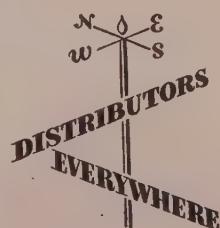


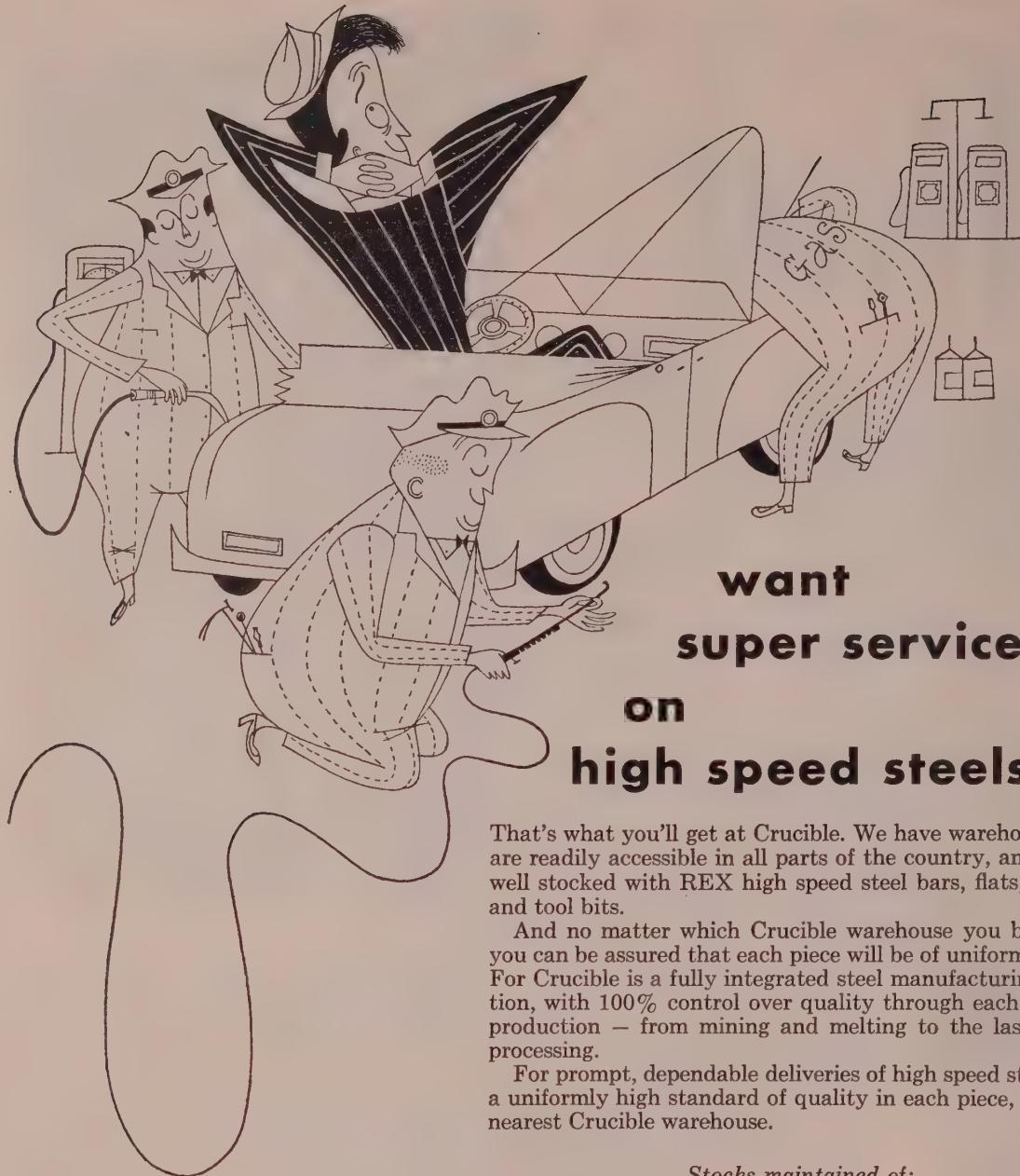
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Wire . . .

(Continued from page 162)

reported, but over-all there is nothing to indicate a general seasonal lage in requirements. Demand for carbon wire continues strong. Customers are currently buying at greater rate than their needs and probably have good inventories third quarter. Manufacturers of carbon wire report strong demand, although producers are not able to find an outlet for all the tonnage they are turning out.

For 19,830 tons, galvanized steel barbed wire, 100-pound coils, Corps Engineers, Pittsburgh, has bids; so on 3,054,114 barbed wire posts, 10 feet, eight inches, to eight feet length.

Chicago—Some pickup in demand for merchant wire products is taking place in the Midwest, paralleling that which occurred earlier in southern territory. Dealers are expanding their inventories and mills are in position to ship new orders on most items fairly promptly.

Pig Iron . . .

Pig Iron Prices, Page 148

Cleveland—Not much change is in evidence in the merchant pig iron market. The furnaces are disposing of their output, but they are not under pressure. Consumption is heavier than it was some time back, reflecting increased demand for automotive and appliance castings. Considerable surprise is expressed over the fact that inquiry for silvery iron has not spurted of late. Although two stacks in southern Ohio producing this grade have been out of production for over a month due to labor trouble, other producers note little pickup in demand on them.

Youngstown—Pittsburgh Coke & Chemical Co. has taken out of blast its Anna blast furnace at Struthers. Company officials have not decided whether to reline the stack or let it stand idle for the present. It is reported here that efforts are being made to purchase the site of the furnace for another purpose.

Boston—Foundry pig iron, Everett, Mass., remains unchanged for second quarter at \$59.50 furnace. This price holds despite a clause in the extension of pig agreements with customers, July 1, 1952, which change the base price as calculated under schedule B when price control ended Mar. 12.

New York—Little change is noted in the movement of pig iron here. Gray iron shops report no appreciable increase in their requirements, with most still operating at little more than 70 per cent of normal, and inventories substantial. Producers could supply more iron if called upon to do so.

Buffalo—Easier tendencies in other markets are not reflected in the pig iron trade here. Sellers have no difficulty disposing of their current output. Electrical appliances and motor castings makers are taking large tonnages. Heavy vessel shipments of iron are reported. General foundries, however, are having difficulty maintaining full operations.

Philadelphia—There is some talk (Turn to page 175)



AMERICAN CHAIN

**"Why do we use American Chain?"**

"For two reasons," said this manufacturer of heavy machinery. "First, we have used American Chain successfully for years. Second, the high strength alloy it is made from permits using smaller diameter chain which is hooked up easily by our men. And the men like the way the grab hooks slip over the links and set themselves securely. I think they just feel safer working with American Chain."

This AMERICAN CHAIN user is referring to our 125 Endweldur alloy steel, heat-treated ACCO Registered sling chain with our series 40 drop-forged grab hooks.

No matter what chains you require, AMERICAN has them and will furnish chains that will last longer . . . and cost less to use. Call your AMERICAN CHAIN distributor today and let him make recommendations. Or write to our York office for Bulletin DH-314.

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American
Chain

Semifinished and Finished Steel Products

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on pages 168-169.

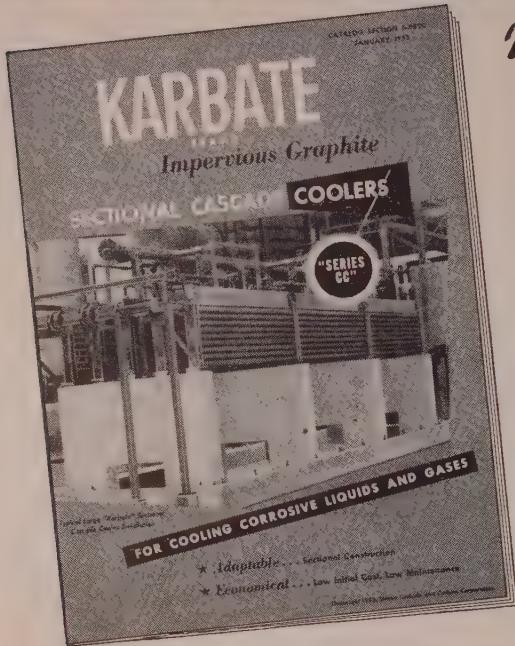
INGOTS, Carbon, Forging (INT)		STRUCTURALS			
Fontana, Calif.	K1	\$.81.00	Carbon steel Stand Shapes		
Munhall, Pa.	U5	.54.00	AlabamaCity, Ala. R2	.3.85	
Seattle	S24	.75.00	Alliquippa, Pa. J5	.3.85	
INGO'S, Alloy (INT)			Bessemer, Ala. T2	.3.85	
Detroit	R7	.57.00	Bethlehem, Pa. B2	.3.90	
Fontana, Calif.	K1	.83.00	Clairton, Pa. U5	.3.85	
Houston	S5	.65.00	Fairfield, Ala. T2	.3.85	
Midland, Pa.	C18	.57.00	Fontana, Calif.	K1	.4.50
Munhall, Pa.	U5	.57.00	Gary, Ind. U5	.3.85	
BILLETS, BLOOMS & SLABS			Geneva, Utah C11	.3.85	
Carbon, Rerolling (INT)			Houston, S5	.4.25	
Bessemer, Pa.	U5	\$.59.00	Ind. Harbor, Ind. I-2	.3.85	
Clairton, Pa.	U5	.59.00	Johnstown, Pa. B2	.3.90	
Ensley, Ala.	T2	.59.00	KansasCity, Mo. S5	.4.45	
Fairfield, Ala.	T2	.59.00	Lackawanna, N.Y. B2	.3.90	
Fontana, Calif.	K1	.78.00	LosAngeles, B3	.4.45	
Gary, Ind.	U5	.59.00	Minnequa, Colo. C10	.4.30	
Johnstown, Pa.	B2	.59.00	Munhall, Pa. U5	.3.85	
Lackawanna, N.Y. B2			Niles, Calif. (22) P1	.4.56	
Munhall, Pa.	U5	.59.00	Phoenixville, Pa. P4	.4.95	
So. Chicago, Ill.	U5	.59.00	Seattle B3	.4.50	
So.Duquesne, Pa.	U5	.59.00	So. Chicago, Ill. U5	W14.3.85	
Carbon, Forging (INT)			So. Francisco B3	.4.40	
Bessemer, Pa.	U5	\$.70.50	Torrance, Calif. C11	.4.45	
Buffalo R2		.70.50	Weirton, W.Va. W6	.4.10	
Canton, O.	R2	.70.50			
Clairton, Pa.	U5	.70.50			
Cleveland R2		.70.50			
Conshohocken, Pa.	A3	.77.50			
Detroit R7		.73.50			
Ensley, Ala.	T2	.70.50			
Fairfield, Ala.	T2	.70.50			
Fontana, Calif.	K1	.89.50			
Gary, Ind.	U5	.70.50			
Geneva, Utah C11		.70.50			
Houston S5		.78.50			
Johnstown, Pa.	B2	.70.50			
Lackawanna, N.Y. B2		.70.50			
LosAngeles B3		.89.50			
Munhall, Pa.	U5	.70.50			
Seattle B3		.89.50			
So. Chicago, R2, U5, W14	.70.50				
So.Duquesne, Pa.	U5	.70.50			
So. SanFrancisco B3		.89.50			
Alloy, Forging (INT)					
Bethlehem, Pa.	B2	\$.76.00			
Buffalo R2		.76.00			
Canton, O.	R2	.76.00			
Canton, O.	T7	.78.60			
Conshohocken, Pa.	A3	.83.00			
Detroit R7		.79.00			
Fontana, Calif.	K1	.95.00			
Gary, Ind.	U5	.76.00			
Houston S5		.84.00			
Ind.Harbor, Ind.	Y1	.76.00			
Johnstown, Pa.	B2	.76.00			
Lackawanna, N.Y. B2		.76.00			
LosAngeles B3		.96.00			
Massillon, O.	R2	.76.00			
Midland, Pa. C18		.76.00			
Munhall, Pa.	U5	.76.00			
Seattle B3		.76.00			
So. Chicago, R2, U5, W14	.76.00				
So.Duquesne, Pa.	U5	.76.00			
So. SanFrancisco B3		.89.50			
ROUNDS, SEMI-FABRICATED TUBE (INT)					
Buffalo R2		\$.87.50			
Canton, O.	R2	.87.50			
Cleveland R2		.87.50			
Fontana, Calif.	K1	.108.50			
Gary, Ind.	U5	.87.50			
Massillon, O.	R3	.87.50			
So. Chicago, Ill.	R2	.87.50			
So.Duquesne, Pa.	U5	.87.50			
SHEET BARS (INT)					
Fontana, Calif.	K1	\$.93.18			
SKELP					
Alliquippa, Pa.	J5	.3.65			
Munhall, Pa.	U5	.3.55			
Warren, O.	R2	.3.55			
Youngstown, R2, U5		.3.55			
WIRE RODS					
Alton, Ill.	L1	.4.70			
AlabamaCity, Ala.	R2	4.325			
Buffalo W12		4.325			
Cleveland A7		4.325			
Donora, Pa.	A7	4.325			
Fairfield, Ala.	T2	4.325			
Fontana, Calif.	K1	5.125			
Houston S5		4.725			
Johnstown, Pa.	B2	4.325			
Joliet, Ill.	A7	4.325			
KansasCity, Mo.	S5	4.665			
LosAngeles B3		5.125			
Minnequa, Colo.	C10	4.575			
Monessen, Pa.	P7	4.525			
No. Tonawanda, N.Y.	B11	4.325			
Pittsburgh, Calif.	C11	4.475			
Portsmouth, O.	P12	4.525			
Roebling, N. J.	R5	4.425			
So. Chicago, Ill.	R2	4.325			
SparrowsPoint, Md.	B2	4.425			
Sterling, Ill.	(11) N15	4.325			
Struthers, O.	Y1	4.325			
Torrance, Calif.	C11	5.125			
Worcester, Mass.	A7	4.625			
SHEET STEEL PILING					
Ind.Harbor, Ind.	I-2	.4.675			
Lackawanna, N.Y. B2		.4.675			
Munhall, Pa.	U5	.4.675			
So. Chicago, Ill.	U5	.4.675			
STRUCTURALS					
Carbon steel Stand Shapes					
AlabamaCity, Ala.	R2	.3.85			
Alliquippa, Pa.	J5	.3.85			
Bessemer, Ala.	T2	.3.85			
Bethlehem, Pa.	B2	.3.90			
Clairton, Pa.	U5	.3.85			
Fairfield, Ala.	T2	.3.85			
Fontana, Calif.	K1	.4.50			
Gary, Ind.	U5	.3.85			
Geneva, Utah C11		.3.85			
Houston S5		.4.25			
Ind.Harbor, Ind.	I-2	.3.85			
Johnstown, Pa.	B2	.3.90			
KansasCity, Mo.	S5	.4.45			
Lackawanna, N.Y. B2		.3.90			
Munhall, Pa.	U5	.3.85			
Seattle B3		.4.50			
So. Chicago, Ill.	U5	W14.3.85			
Wide Flange					
Bethlehem, Pa.	B2				
Clairton, Pa.	U5				
Fontana, Calif.	K1				
Johnstown, Pa.	B2				
Lackawanna, N.Y. B2					
Munhall, Pa.	U5				
So. Chicago, Ill.	U5				
I-STEEL, I-FLANGE					
Bessemer, Ala.	T2				
Clairton, Pa.	U5				
Cleveland, Ind.	I-2				
Ind.Harbor, Ind.	I-2				
Johnstown, Pa.	B2				
Lackawanna, N.Y. B2					
Munhall, Pa.	U5				
Seattle B3					
So. Chicago, Ill.	U5				
H.S., L.A. Stand Shapes					
Alliquippa, Pa.	J5	.5.80			
Bessemer, Ala.	T2	.5.80			
Bethlehem, Pa.	B2	.5.80			
Clairton, Pa.	U5	.5.80			
Fairfield, Ala.	T2	.5.80			
Fontana, Calif.	K1	.6.45			
Gary, Ind.	U5	.5.80			
Geneva, Utah C11		.5.80			
Ind.Harbor, Ind.	I-2	.5.80			
Johnstown, Pa.	B2	.5.80			
Lackawanna, N.Y. B2		.5.80			
Munhall, Pa.	U5				
So. Chicago, Ill.	U5				
H.S., L.A. Wide Flange					
Bethlehem, Pa.	B2				
Lackawanna, N.Y. B2					
Munhall, Pa.	U5				
So. SanFrancisco B3					
Struthers, O.	Y1	.6.30			
H.S., L.A. Wide Flange					
Bethlehem, Pa.	B2				
Lackawanna, N.Y. B2					
Munhall, Pa.	U5				
So. Chicago, Ill.	U5				
BEARING PILES					
Munhall, Pa.	U5				
So. Chicago, Ill.	U5				
PLATES, High Strength Low Alloy					
Alliquippa, Pa.	J5	.5.95			
Bessemer, Ala.	T2	.5.95			
Clairton, Pa.	U5	.5.95			
Cleveland J5, R2		.5.95			
Conshohocken, Pa.	A3	.6.20			
Ecorse, Mich.	G5	.6.90			
Fairfield, Ala.	T2	.5.95			
Fontana, Calif. (30) K1		.6.65			
Gary, Ind.	U5	.5.95			
Geneva, Utah C11		.5.95			
Ind.Harbor, Ind.	I-2	.5.95			
Ind.Harbor, Ind.	Y1	.6.45			
Johnstown, Pa.	B2	.5.95			
Munhall, Pa.	U5	.5.95			
Washington J5		.5.95			
Seattle B3		.6.85			
Sharon, Pa.	S3	.5.95			
So. Chicago, Ill.	U5	.5.95			
SparrowsPoint, Md.	B2	.5.95			
Warren, O.	R2	.5.95			
Youngstown Y1		.6.45			
Youngstown U5		.5.95			
PLATES, Open-Hearth Alloy					
Claymont, Del.	G22	.5.35			
Coatesville, Pa.	L7	.5.75			
Conshohocken, Pa.	A3	.5.55			
Fontana, Calif.	K1	.6.20			
Gary, Ind.	U5	.5.25			
Johnstown, Pa.	B2	.5.25			
Munhall, Pa.	U5	.5.25			
Seattle B3		.6.85			
Sharon, Pa.	S3	.5.95			
So. Chicago, Ill.	U5	.5.95			
SparrowsPoint, Md.	B2	.5.95			
I-FLOR PLATES					
Cleveland J5		.4.95			
Conshohocken, Pa.	A3	.4.95			
Ind.Harbor, Ind.	I-2	.4.95			
Munhall, Pa.	U5	.4.95			
So. Chicago, Ill.	U5	.4.95			
PLATES, Ingol Iron					
Ashland, c.l. (15) A10		.4.15			
Cleveland, c.l. R2		.4.15			
Warren, O.	c.l. R2	.4.15			

Key to Producers

Key Producers	Key Producers
A1 Acme Steel Co.	C11 Columbian-Geneva Steel
A3 Alan Wood Steel Co.	C12 Columbian Steel & Shaft
A4 Allegheny Ludlum Steel	C13 Columbia Tool Steel Co.
A7 American Steel & Wire	C14 Compressed Steel Shaft
A8 Anchor Drawn Steel Co.	C16 Continental Steel Corp.
A9 Angel Nail & Chaplet	C17 Copperweld Steel Co.
A10 Armclo Steel Corp.	C18 Crucible Steel Co.
A11 Atlantic Steel Co.	C19 Cumberland Steel Co.
A13 American Cladmetals Co.	C20 Cuyahoga Steel & Wire
B1 Babcock & Wilcox Co.	C22 Clayton Steel Products Dept., Wickwire Spencer Steel Division
B2 Bethlehem Steel Co.	D2 Detroit Steel Corp.
B3 Beth. Pac. Coast Steel	D3 Detroit Tube & Steel
B4 Blair Strip Steel Co.	D4 Dizzon & Sons, Henry
B5 Bliss & Laughlin Inc.	D6 Driver Harris Co.
B6 Boieldie Steel Corp.	D7 Dickson Weatherproof Nail Co.
B8 Braeburn Alloy Steel	E1 Eastern Gas & Fuel Assoc.
B11 Buffalo Bolt Co.	E2 Eastern Stainless Steel
B12 Buffalo Steel Div., H. K. Porter Co.	E4 Electro Metallurgical Co.
B14 A. M. Byers Co.	E5 Elliott Bros. Steel Co.
C1 Calstray Steel Corp.	E6 Empire Steel Corp.
C2 Calumet Steel Div.	F2 Firth Sterling Inc.
Borg-Warner Corp.	F3 Fitzsimmons Steel Co.
C4 Carpenter Steel Co.	F4 Follansbee Steel Corp.
C5 Central Iron & Steel Div.	F5 Franklin Steel Div.
Barium Steel Corp.	Borg-Warner Corp.
C7 Cleve. Cold Rolling Mills	F6 Fretz-Moon Tube Co.
C9 Cold Metal Products Co.	
C9 Colonial Steel Co.	
	G2 Globe Iron Co.
	G3 Globe Steel Tubes Co.
	G4 Granite City Steel Co.
	G5 Great Lakes Steel Co.
	G6 Greer Steel Co.
	H1 Hanna Furnace Corp.
	I-1 Igoe Bros. Inc.
	I-2 Inland Steel Co.
	I-3 Interlake Iron Corp.
	I-4 Ingersoll Steel Div., Borg-Warner Corp.
	I-7 Indiana Steel Wire
	J1 Jackson Iron & Steel Co.
	J3 Jessop Steel Co.
	J4 Johnson Steel & Wire
	J5 Jones & Laughlin Steel
	J6 Joslyn Mfg. & Supply
	J7 Judson Steel Corp.
	J8 Jersey Shore Steel Co.
	K1 Kaiser Steel Corp.
	K2 Keekul Electro Met
	K3 Keystone Drawn Steel
	K4 Keystone Steel & Wire
	L1 Laclede Steel Co.
	L2 LaSalle Steel Co.
	L3 Latrobe Steel Co.
	L5 Lockhart Iron & Steel
	L6 Lone Star Steel Co.
	L7 Lukens Steel Co.

b3 N14	5.80	Gary,Ind. U5	5.675	GraniteCity,Ill. G4	5.625	SHEETS, Long Terne Steel	SparsrowsPoint,Md. B2	5.70		
1 Springs S5	6.45	Ind.Harbor,Ind. I-2	5.675	Ind.Harbor,Ind. I-2	4.925	(Commercial Quality)	Warren,O. R2	5.65		
anFrancisco B3	5.45	Ind.Harbor,Ind. Y1	6.175	Irvin,Pa. U5	4.925	BeechBottom,W.Va.W10	Weirton,W.Va. W6	6.10		
rowsPt. 4-1" B2	5.25	Lackawanna(35) B2	5.675	Middleton,O. A10	4.925	Gary,Ind. U5	5.475	Youngstown Y1	6.15	
lampsport,Pa. S19	5.35	Munhall U5	5.675	Youngstown Y1	4.925	Mansfield,O. E6	6.05	Youngstown U5	5.65	
L STEEL BARS		Pittsburgh J5	5.675	BLACK PLATE	Middleton,O. A10	5.475	STRIP, Cold-Rolled	SparsrowsPoint,Md. B2	5.70	
JagoHts.(3,4) C2	4.75	Sharon,Pa. S3	5.675	(Base Box)	Niles,O. N12	6.275	Cleveland J5	7.45		
JagoHts.(3,4) I-2	4.75	So.Chicago,Ill. U5	5.675	Aliquippa,Pa. J5	6.50	Cleveland A7	7.30			
nklin,Pa. (3,4) F5	4.75	SparsrowsPoint(36) B2	5.675	Fairfield,Ala. T2	6.60	Dover,O. G6	8.00			
tWorth,Tex.(28) T4	4.55	Warren,O. R2	5.675	Gary,Ind. U5	6.50	Ecorse,Mich. G5	8.15			
atngt,W.Va.(3) W7	5.75	Ind.Harbor,Ind. I-2	6.175	GraniteCity,Ill. G4	6.70	Lackawanna,N.Y. B2	7.90			
tion,O.(3) P11	4.75	Ind.Harbor,Ind. I-2	6.175	Ind.Harbor,Ind. I-2, Y1.650	6.70	Snaron,Pa. S3	7.30			
line,Ill.(3) R5	4.05	Irvin,Pa. U5	5.675	Irvin,Pa. U5	6.50	SparsrowsPoint,Md. B2	7.90			
awanda,(3,4) B12	5.00	Youngstown U5	5.675	Niles,O. R2	6.50	Warren,O. R2	7.30			
lampsport,(S) S19	5.25	Youngstown Y1	6.175	Pittsburg,Calif. C11	7.25	Weirton,W.Va. W6	7.95			
lampsport,Pa. S19	5.35	SHEETS, Cold-Rolled Steel		Aliquippa,Pa. J5	8.50	Youngstown Y1	7.80			
S, Wrought Iron		(Commercial Quality)		Fairfield,Ala. T2	8.80	STRIP, Hot-Rolled Carbon				
Add 4.7% to base and		Butler,Pa. A10	4.575	Gary,Ind. U5	8.70	Ala.Cit,Ala.(27) R2	3.725			
extras)		Cleveland J5, R2	4.575	Ind.Harbor,Ind. I-2, Y1.650	8.95	Alton,Ill. L1	4.20			
onomy,Pa.(S.R.) B14	9.60	Fairfield,Ala. T2	4.575	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ashland,Ky.(8) A10	3.725			
onomy,(Staybolt) B14	11.90	Follansbee,W.Va. F4	5.575	Ind.Harbor,Ind. I-2, Y1.650	8.95	Atlanta A1	4.275			
K.Rks.(Staybolt) L5	14.50	Fontana,Calif. K1	5.675	Ind.Harbor,Ind. I-2, Y1.650	8.95	Bessemer,Ala. T2	3.725			
K.Rks.(S.R.) L5	9.60	Gary,Ind. U5	4.575	Ind.Harbor,Ind. I-2, Y1.650	8.95	Bridgeport,Conn.(10) S15	4.225			
K.Rks.(D.R.) L5	13.00	GraniteCity,Ill. G4	5.275	Pitts,Cal.C11	9.45	Buffalo(27) R2	3.725			
EETs, Hot-Rolled Steel		Ind.Harbor,Ind. I-2	4.575	Sp.Pt.Md. B2	8.80	Butler,Pa. A10	3.725			
(18 gage and heavier)		Irvin,Pa. U5	4.575	Warren,O. R2	8.70	Carnegie,Pa. S13	4.225			
abamaCity,Ala. R2	3.775	Lackawanna,N.Y. B2	4.575	Weirton,W.Va.W6	8.70	Conshohocken,Pa. A3	4.125			
hland,Ky.(8) A10	3.775	Middletown,O. A10	4.575	Ind.Harbor,Ind. I-2, Y1.650	8.95	Detroit MI	4.40			
tier,Pa. A10	3.775	Pittsburgh,Calif. C11	5.525	Fairfield,Ala. T2	5.85	Ecorse,Mich. G5	4.025			
veland,J5, R2	3.775	Pittsburgh,Calif. C11	5.525	Gary,Ind. U5	6.10	Fairfield,Ala. T2	3.725			
nshhocken,Pa. A3	4.175	SparsrowsPoint,Md. B2	4.575	Ind.Harbor,Ind. I-2, Y1.650	8.95	Fontana,Calif. K1	5.175			
trot M1	4.40	Warren,O. R2	4.575	Ind.Harbor,Ind. I-2, Y1.650	8.95	Gary,Ind. U5	3.725			
orse,Mich. G5	3.975	Weirton,W.Va. W6	4.575	Ind.Harbor,Ind. I-2, Y1.650	8.95	Houston,Tex. S5	4.125			
ifield,Ala. T2	3.775	West Leechburg,Pa. A4	5.45	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	3.725			
ntana,Calif. K1	4.825	Youngstown Y1	4.575	Ind.Harbor,Ind. I-2, Y1.650	8.95	Johnstown,Pa.(26) B2	3.725			
ry,Ind. U5	3.775	SHEETS, Galv'd No. 10 Steel		Ind.Harbor,Ind. I-2, Y1.650	8.95	Seattle(25) B3	8.65			
neva,Utah C11	3.875	AlabamaCity,Ala. R2	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	Sharon,Pa. S3	5.65			
aniteCity,Ill. G4	4.30	Ashland,Ky.(8) A10	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	KansasCity,Mo.(9) S8	5.4325			
l Arbor,Ind. I-2, Y1	3.775	Canton,O. R2	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	So.SanFrancisco(25) B3	6.40			
in,Pa. U5	3.775	Delphos,O. N16	5.675	SHEETS, Culvert, Cu Cu		<i>(Turn to page 172)</i>				
unhall,Pa. U5	3.775	Dover,O. R1	5.775	No. 16 Alloy		TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb	
les,O. N12	5.425	Fairfield,Ala. T2	5.075	Ashland,Ky. A10	5.875	Aliquippa,Pa. J5	\$7.40	\$7.65	\$8.05	
tsburg,Calif. C11	4.475	Irvin,Pa. U5	5.075	Canton,O. R2	5.925	Fairfield,Ala. T2	7.50	7.75	8.15	
tsburg,J5	3.775	Kokomo,Ind.(13) C16	5.475	Fairfield,Ala. T2	6.125	Gary,Ind. U5	7.40	7.65	8.05	
aron,Pa. S3	4.175	MartinsFerry,O. W10	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	GraniteCity,Ill. G4	7.60	7.85	8.25	
Chicago,Ill. W14	3.775	Niles,O. N12	6.275	Ind.Harbor,Ind. I-2, Y1.650	8.95	IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05	
uebenville,O. W10	3.775	Pittsburg,Calif. C11	5.325	Ind.Harbor,Ind. I-2, Y1.650	8.95	Irvin,Pa. U5	7.40	7.65	8.05	
rrance,Calif. C11	4.475	SparsrowsPoint,Md. B2	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	Niles,O. R2	7.40	7.65	8.05	
allen,O. R2	3.775	SparsrowsPt. B2	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	Pittsburg,Calif. C11	8.15	8.40	8.80	
erlton,W.Va. W6	3.775	SparsrowsPt. B2	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	SparsrowsPoint,Md. B2	7.50	7.75	8.15	
estLeechburg,Pa. A4	3.925	SparsrowsPt. B2	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	Weirton,W.Va. W6	7.40	7.65	8.05	
ngstown,U5, Y1	3.775	Torrance,Calif. C11	5.275	Ind.Harbor,Ind. I-2, Y1.650	8.95	Yorkville,O. W10	7.40	7.65	8.05	
EETs, H.R. (19 gage)		Weirton,W.Va. W6	5.075	SHEETS, Galvanized Culvert, No. 16		SHEETS, SILICON, H.R. or C.R.(22 Ga.)	Arma-Elec-		Dyna-	
abamaCity,Ala. R2	4.925	SHEETS, Galvanized No. 10, High-Strength Low-Alloy		Pure Iron		Field	Coils	Coils	Coils	
over,O. R1	5.825	Irvin,Pa. U5	5.675	Ashland,Ky. A10	6.125	Cut lengths	Cut lengths	Cut lengths	Cut lengths	
ansfield,O. E6	5.65	SparsrowsPoint(39) B2	7.775	Canton,O. R2	5.775	1/2 lower	1/2 lower	1/2 lower	1/2 lower	
orrence,Calif. C11	5.575	SHEETS, Galvannealed Steel		Ind.Harbor,Ind. I-2	5.075	1/2 lower	1/2 lower	1/2 lower	1/2 lower	
EEETS, Cold-Rolled High-Strength Low-Alloy		Canton,O. R2	5.625	Irvin,Pa. U5	5.075	COILS (Cut lengths 1/2 lower)	Field	Field	Field	
leland,J5, R2	6.925	Irvin,Pa. U5	5.625	Kokomo,Ind.(13) C16	6.025	BeechBottom,W10 (cut lengths)	7.85	9.10	9.90	
orse,Mich. G5	7.475	Kokomo,Ind.(13) C16	6.025	MartinsFerry,O. W10	5.075	BrackenridgePa. A4	8.35	9.60	10.40	
ontana,Calif. K1	7.875	Niles,O. N12	6.825	SparsrowsPoint,Md. B2	5.075	GraniteCity,Ill. G4 (cut lengths)	8.55	9.80	10.40	
ary,Ind. U5	6.925	SHEETS, Galvanized Ingot Iron		Warren,O. R2	5.075	IndianaHarbor,Ind. I-2	7.55	7.85	8.05	
ndianaHarbor,Ind. I-2	7.425	No. 10 flat		Zanesville,O. A10	5.075	Mansfield,O. E6 (cut lengths)	7.20	7.35	7.55	
ndianaHarbor,Ind. I-2	6.925	Ashland,Ky.(8) A10	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	Niles,O. N12 (cut lengths)	7.05	7.35	7.55	
rvn,Pa. U5	6.925	Canton,O. R2	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	Vandergrift,Pa. U5	7.85	8.35	9.60	
tsburg,J5	6.925	Irvin,Pa. R2	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	Warren,O. R2	7.55	7.85	8.05	
SparsrowsPoint(38) B2	6.925	SparsrowsPt. B2	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	Zanesville,O. A10	7.85	8.35	9.60	
Warren,O. R2	6.925	SHEETS, Galvanized Ingot Iron		SHEETS, ALUMINIZED		COILS (Cut Lengths 1/2 lower)	Arma-Elec-	Coils	Dyna-	
erlton,O. R2	6.925	SparsrowsPoint,Md. B2	5.075	Ind.Harbor,Ind. I-2, Y1.650	8.95	Transformer Grade	72	65	58	52
W.Va. W6	7.725	SparsrowsPt. B2	5.075	Middleton,O. A10	5.075	BeechBottom,W10 (cut lengths)	10.45	11.00	11.70	12.50
ngstown,Y1	7.425	Torrance,Calif. C11	5.325	Ind.Harbor,Ind. I-2, Y1.650	8.95	BrackenridgePa. A4	10.95	11.50	12.20	13.00
SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy		Weirton,W.Va. W6	5.775	Ind.Harbor,Ind. I-2, Y1.650	8.95	Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Cleveland J5, R2	5.675	SHEETS, ZincGrip Ingot Iron		Ind.Harbor,Ind. I-2, Y1.650	8.95	Warren,O. R2	10.95	11.50	12.20	13.00
Medart Co.	5.925	Butler,Pa. A10	5.575	Ind.Harbor,Ind. I-2, Y1.650	8.95	Zanesville,O. A10	10.95	11.50	12.20	13.00
Monarch Steel Co.	6.225	SHEETS, ZincGrip Steel		SHEETS, ALUMINIZED		H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22Ga.)	T-100	T-90	T-80	T-73
National Supply Co.	6.225	Butler,Pa. A10	5.325	Ind.Harbor,Ind. I-2, Y1.650	8.95	Transformer Grade	72	65	58	52
National Tube Div.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	BeechBottom,W10 (cut lengths)	10.45	11.00	11.70	12.50
Nelsen Steel & Wire Co.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	BrackenridgePa. A4	10.95	11.50	12.20	13.00
New Eng.-HighCarb Wire	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Newman-Crosby Steel	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	Warren,O. R2	10.95	11.50	12.20	13.00
Niles Rolling Mill Dlv.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	Zanesville,O. A10	10.95	11.50	12.20	13.00
Northwst. Steel Roll Mills	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.40C-0.60C	0.60C-0.80C	1.05C-1.35C
Northwestern S.W. Co.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	Transformer Grade	680	740	795	835
New Delphos Mfg. Co.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	Bristol,Conn. W1	7.65	8.25	8.75	9.25
Oliver Iron & Steel Corp.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	Carnegie,Pa. S13	7.65	8.25	8.75	9.25
Oregon Steel Mills	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	Cleveland A7	7.65	8.25	8.75	9.25
Pacific States Steel Corp.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	Dearborn,Mich. D3	6.05	7.90	8.50	9.25
Pacific Tube Co.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	Detroit D2	6.45	7.50	8.10	8.75
Phoenix Iron & Steel Co.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	Dover,O. G6	5.70	7.65	8.25	10.20
Filgrin Drawn Steel	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	FranklinPark,Ill. T6	5.45	7.45	8.40	10.35
Pittsburgh Coke & Chem.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	Harrison,N.J. C18	5.95	7.65	8.25	10.20
Pittsburgh Steel Co.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	Trenton,N.J. R5	5.80	7.65	8.25	10.20
Pittsburgh Tube Co.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	WallaWalla,Mass. A7	5.40	7.60	8.25	10.20
Pollak Steel Co.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	WallaWalla,Mass. B6	5.40	7.60	8.25	10.20
Portsmouth Division,	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	WallaWalla,Mass. C8	5.40	7.60	8.25	10.20
Detroit Steel Corp.	6.225	Ind.Harbor,Ind. I-2, Y1.650	8.95	Ind.Harbor,Ind. I-2, Y1.650	8.95	WallaWalla,Mass. D8	5.40	7.60	8.25	10.20

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ORES-COKE-REFRACTORIES

Prices as reported to STEEL; changes shown in italic.

ORES

Lake Superior Iron Ore

Prices effective for ore delivered up to and including June 30, 1953; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)	51.50%
Old range bessemer	\$10.10
Old range nonbessemer	9.95
Yasabi bessemer	9.85
Yasabi nonbessemer	9.70
Open-hearth lump	10.05
High phosphorus	9.70
The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect on Dec. 31, 1952, and increases or decreases after such date for buyer's account.	

Eastern Local Iron Ore

Cents per unit del. E. Pa., Foundry and basic 58-62% concentrates	
contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports	
Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, duty paid	
Foreign wolframite and scheelite, per net ton unit	\$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, \$1.18-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90c-93c.	
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Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.	
Indian and African	\$40.00-\$42.00
48% 2.8:1	44.00-46.00
48% 3:1	32.00-34.00

South African Transvaal

44% no ratio	\$27.00-\$28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom. \$32
Domestic (Rail nearest seller)	

48% 3:1	\$39.00
Molybdenum	

Sulphide concentrates per lb. molybdenum content, mines	\$1.00
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REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., \$89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochcaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., \$99.30; Salina, Pa., \$104.55; Niles, O., \$109; Los Angeles, Pittsburgh, Calif., \$132.30.	
Silica Brick	

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., \$99.30; Hays, Pa., \$105.10; Niles, O., \$107; E. Chicago, Ind., Joliet, Rockdale, Ill., \$109.70; Cutler, Utah, \$116.55; Los Angeles, \$122.85.	
Insulating Fire Brick	

2300° F: Massillon, O., \$178.50; Clearfield, Pa., \$179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., \$186.90.	
Ladle Brick	

Dry Pressed: Bessemer, Ala., \$64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wells-	
ville, O., \$69.30; Mexico, Mo., \$73.50; Clearfield, Pa., Portsmouth, O., \$83; Perla, Ark., \$92.40; Los Angeles, \$110.25; Pittsburgh, Calif., \$111.30.	

Sleeves

Reedsdale, Pa., \$127; Johnstown, Pa., \$127.30; Clearfield, Pa., \$135; St. Louis, \$138; Athens, Tex., \$140.90.

Nozzles

Reedsdale, Pa., \$203.20; Johnstown, Pa., \$208.40; Clearfield, Pa., \$219.45; St. Louis, \$224.65; Athens, Tex., \$225.20.

Runners

Reedsdale, Pa., \$158.20; Johnstown, Pa., \$161.70; Clearfield, Pa., \$168.60; St. Louis, \$170.30; Athens, Tex., \$174.40.

High-Alumina Brick

50 Per Cent: Clearfield, Pa., St. Louis, Mexi-co, Mo., \$166.30; Danville, Ill., \$169.30. 60 Per Cent: St. Louis, Mexico, Vandalia, Mo., \$210.20; Danville, Ill., \$213.20.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., \$244.85; Danville, Ill., \$247.85; Clearfield, Pa., \$252.

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsville fur	\$14.50-15.00
Connellsville dry	16.50-17.50
New River foundry	20.80
Wise county foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	\$24.00
Everett, Mass., ovens New England, del.	26.05
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
LoneStar, Tex., ovens	18.50
Philadelphia, ovens	23.95
Sweden, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.03
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within \$4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	30.00-33.00
Industrial xylo	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	\$44-45
Birmingham area	\$49.50

Cents per pound, ovens

Phenol, 40 (carlots, nonreturnable drums)	17.25
---	-------

FLUORSPAR

Metalurgical grade, f.o.b. shipping point, Ill., Ky., net tons, carloads, effective CaF_2 content 70%, \$43; 60%, \$40. Imported, net ton, duty paid, metallurgical grade, \$30-\$35.



Sturtevant
TORQUE TESTING
FIXTURE

FOR TESTING Screws, thread-cutting and thread-forming screws—all types of threaded fasteners; threaded parts and threaded connections.

FOR MANUFACTURERS
DESIGNERS
INSPECTORS
TOOL ENGINEERS
LABORATORIES and for
PRODUCT CONTROL

Capacities:
(0-200 in.
lbs.) or
(0-150 ft.
lbs.)
in assembly.

Write for Bulletin TTF

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PROMPT WAREHOUSE SERVICE ONLY

Most Complete Stock in America of

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Phone: Grove Hill 6-2600
Fenner Street, Providence, R. I.
Phone: Gospas 1-5573, 1-8573

TWELD STANDARD PIPE, T & C Carload discounts from list, %

—Inches	½	%	1	1 ¼	1 ½	2	2 ¼	3
Per Ft.	8.5c	11.5c	17c	23c	27.5c	37c	58.5c	76.5c
nds Per Ft.	0.85	1.13	1.68	2.28	2.73	3.68	5.82	7.62
lipa, Pa. J5 (t)	32.5	15.25	35.5	18.25	38.5	20.5	39.5	21.25
n, Ill. L1 (t)	29.5	10.5	32.5	14.5	35	18.5	36.5	20.5
wood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.5	39.5	21.75
Pa. N2 (t)	32.5	13.25	35.5	17.25	38	20.5	39.5	21.75
ana, Calif. K1 (t)	19.5	0.25	22.5	4.25	25	7.15	25.5	8.75
Harbor, Ind. Y1 (t)	31.5	14.25	34.5	18.25	37	21.75	37.5	21.75
in, O. N3 (*)	32.5	22.25	35.5	26.25	38	29.75	38.5	28.25
on, Pa. M6	32.5	14.25	35.5	18.25	38	21.25	38.5	20.75
rrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.75
ngstown R2 (**)	32.5	16.25	35.5	20.25	38	23.75	38.5	23.75
ngstown Y1 (t)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.75
oatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19.5

SLEEVLESS STANDARD PIPE, T & C Carload discounts from list, %

—Inches	2	2 ½	3	3 ½	4	5	6	
Per Ft.	37c	58.5c	76.5c	92c	\$1.09	\$1.48	\$1.92	
nds Per Ft.	3.68	5.82	7.62	9.20	10.89	14.81	19.18	
Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	
guippa, Pa. J5 (t)	24	6	27	8.25	27	8.25	29	10.25
bridge, Pa. N2	34	6	27	8.25	27	8.25	29	10.25
ain, O. N3 (*)	24	12.75	27	12.75	27	12.75	29	14.75
ngstown Y1 (t)	24	7.50	27	9.25	27	11.25	29	11.25

ELECTRIC WELD STANDARD PIPE, T & C

ingstown, R2 (**) 24 8.25 27 9.75 27 9.75 29 11.75 29 11.75 33.75 16.5 33.75 16.5

TWELD STANDARD PIPE, T & C Carload discounts from list, %

—Inches	½	¼	%	3 ½	4	5	6	
Per Ft.	5.5c	6c	6c	92c	\$1.09	\$1.48	\$1.92	
nds Per Ft.	0.24	0.42	0.57	9.20	10.89	14.81	19.18	
Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	Blk Galv	
wood, W. Va. W10	29.5	+ 0.25	23.25	+ 3.5	17.75	+ 7.75	33	14.25
der, Pa. F6 (t)	30.5	1.25	25	+ 1.75	20	+ 5.5	..	..
Pa. Pa. N2 (t)	30.5	1.25	25	+ 1.75	20	+ 5.5	33	14.25
ron, Pa. M6 (t)	29.5	- 1.75	23	+ 2.25	18	+ 5.25	..	..
ron, Pa. S4 (t)	30.5	1.25	25	+ 1.75	20	+ 5.5	301	44.25
arrows Pt., Md. B2	28.5	+ 0.75	23	+ 3.75	18	+ 7.50	302	44.50
ngstown R2 (**)	28.5	+ 0.75	23	+ 3.75	18	+ 7.50	303	46.50
oatland, Pa. W9	28.5	+ 0.75	23	+ 3.75	18	+ 7.50	304	61.50

Ivanized pipe discounts based on zinc price of: (t), 14c; (t), 12.50c; (**), 11.50c; (*), with discounts adjusted depending on price of zinc at time of shipment.

BOILER TUBES

t base c.l. prices, dollars per 100 ft., mill; minimum

thicknes, cut lengths 10 to 24 ft., inclusive.

D. B.W.	Seamless	—Elec. Weld—
Gage	H.R. C.D.	H.R. C.D.
12	14.19	16.71-17.77
13	16.97	19.80-21.26
13	18.22-18.77	22.08-22.82
13	20.35-21.35	24.92-25.49
13	22.81-23.93	27.94-28.58
12	25.69-26.66	31.38-32.18
12	28.40-29.36	34.55-35.58
12	31.28-32.17	37.83-39.19
12	33.87-34.82	40.09-42.44
12	35.78-36.87	42.11-44.93

OLTS, NUTS

ARRIAGE, MACHINE BOLTS

F.o.b. midwestern plants; per cent off list for less than

use lots to consumers)

in. and shorter:

½-in. & smaller diam. 15

½-in. & ¾-in. 18.5

¾-in. & larger 17.5

longer than 6 in.:

All diam. 14

All bolts, all diams.:

6 in. and shorter ... 23

over 6 in. long ... 21

tibbed Necked Carriage 18.5

Blank 34

ow 34

Step, Elevator, Tap and

Sleigh Shoe 21

ire Bolts 21

oller & Fitting-Up Bolts 31

(1020 steel; packaged; per cent off list)

6 in. or shorter:

½-in. & smaller 42

¾-in. through 1 in. 34

Longer than 6 in.:

¾-in. & smaller 26

¾-in. through 1 in.

H.P. Hex.:

½-in. & smaller 26

½-in. & ¾-in. 16.5

¾-in. & 1 ½-in. 6.5

1 ½-in. & 1 ¾-in. 22

1 ½-in. & 1 ¾-in. 12

1 ½-in. & 1 ¾-in. 19.5

1 ½-in. & larger 12

6.5

1 ½-in. & smaller 22

1 ½-in. & 1 ¾-in. 29.5

1 ½-in. & 1 ¾-in. 24

1 ½-in. & 1 ¾-in. 13

Light 6

35

CARBON

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches

Cents

Molybdenum:

99.9%, minus 200

Less than 1000 lb. 6.00

* Plus cost of metal.

STAINLESS STEEL

(Add 4.7% to extras where new extra cards have not been issued)
(Add 4.7% to extras where new extra cards have not been issued)
(Add 4.7% to extras where new extra cards have not been issued)
(Add 4.7% to extras where new extra cards have not been issued)
(Add 4.7% to extras where new extra cards have not been issued)

Fort Wayne, Ind., bars and wire, except 501 & 502 J8 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Harrison, N. J., wire, Type 302, 33.00c; Type 304, 34.50c; Type 316, 51.50c, including 4.7% increase.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 501, 502 and 34.25c on Type 301 and 301 S3.

So. Chicago, bars, shapes U5.

Syracuse, N. Y., bars, wire & strip C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 32.00c, strip 61.00c W4.

Watervliet, N. Y., structural bars A4.

Waukegan, bars & wire A7.

West Leechburg, strip A4.

Youngstown, strip C8.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge Iron: Cents

98% Fe, annealed 18.00

Unannealed 14.50

Swedish c.i.f. N.Y. 10.90

c.i.f. in bags 10.90

Electrolytic iron: Annealed, 99.5% Fe. 42.50

Unannealed (99% Fe) 36.50

Unannealed (99% Fe) (minus 325 mesh) 53.50

Powder Flakes 48.50

Carnelian Iron: 97.9-99.8% size 5 to 10 microns 83.00-148.00

Aluminum: Carlot, freight allowed 31.00

Atomized, 500 lb drums, freight allowed 33.00

Phosphor-Copper, 20-ton lots 50.00

Antimony, 500 lb lots. 71.00

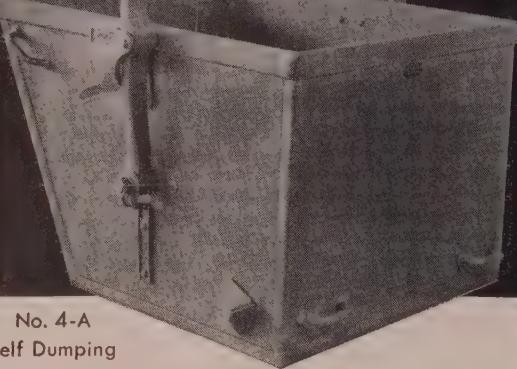
Brass, 20-ton lots. 31.00-34.25

Bronze, 10-ton lots 51.25-60.00

Phosphor-Copper, 20-ton lots 50.00

Copper, 20-ton lots 50.00

PENN BUCKETS



No. 4-A
Self Dumping

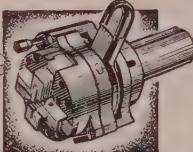
Careful balancing makes Penn Buckets self dumping when loaded and self righting when empty. Welded construction prevents "clinging" makes them empty easily and completely.

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Insert Chaser
DIE HEADS
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less downtime, more pieces per day.



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SPRINGS
STAMPINGS
WIRE FORMS

M. D. Hubbard Spring Company
604 CENTRAL AVE.
PONTIAC, MICH.



Pig Iron . . .*Continued from page 167*

of possible freight equalization by Buffalo pig iron producers in view of the generally easier market tone. If it is pointed out, would mean average absorption of around \$4 on. At present, such a move doesn't seem probable but partial action may be possible.

Cincinnati—Merchant pig iron business has undergone little change. Mills are selling all the iron they produce. Demand from the machine tool industry is holding up well. The situation with jobbing foundries is steady.

Louis—This area's two blast furnaces have shifted 100 per cent to pig production, foundry iron output having caught up with demand probably until July 1.

Battle—Foundry operators anticipate a satisfactory season. Private construction and defense work are reflected in demand for castings.

Considerable Australian pig iron has been purchased by converters in this area. One sizable cargo was placed at \$58.50 per gross ton, c. i. f. Seattle. This is approximately \$5 under the going domestic market.

Iron Ore . . .

Iron Ore Prices, Page 171

Cleveland—The lake iron ore shipping season of 1953 is getting away on a fast start. Marking one of the liveliest season openings in years, the port already has hauled down from the lake ports 1,139,569 gross tons. For the week ended Apr. 6 the movement was 1,080,470 tons, according to the Lake Superior Iron Ore Association. Total movement to Apr. 6 this season is more than 1 million tons ahead of that in the like period of the 1952 season. Goal for the 1953 season is placed in excess of 10 million tons. Last week lake carriers were passing through the port at the rate of about 1 per hour. Agreements have been entered into with several shippers on a new schedule of lake freight rates for transportation of iron ore in the 1953 shipping season. The new rates are: from head of Lake Superior to lower lake ports, \$1.60 per gross ton; carquette to lower lake ports, \$1.44;

Escanaba to Lake Erie, \$1.20; Escanaba to Lake Michigan, 96 cents. These rates are 5 cents per ton above those in effect at the end of the 1952 shipping season. Shipping rates on limestone also are up 5 cents per ton.

Scrap . . .

Scrap Prices, Page 176

Philadelphia—Steel scrap prices are more stable. Most mills closed on some tonnage over the past several days. There has been no attempt, however, to place particularly large tonnage, even though inventories are limited. Consumers appear confident with spring at hand they will have little difficulty keeping abreast of requirements. There is a slight easing in No. 1 bundles to a spread of \$44 to \$45 delivered, in mixed borings and turnings to \$35 to \$36, and in short shovel turnings to \$36 to \$37. Drop broken machinery is holding at \$49 to \$50, which grade was erroneously quoted in these columns at \$40 to \$50 last week due to typographical error.

Pittsburgh—Scrap is moving at a snail's pace. One reason advanced for this was the Union railroad strike. Scrap intended for the mills served by this road went to other works with the result these latter became topheavy on inventory. Jones & Laughlin Steel Corp. held up shipments for about 15 days to enable it to absorb the extra tonnage received during the strike. Some low phosphorus grades are moving above ceilings. In a week marked by sluggish activity, the principal price move noted is a drop of \$1 on short shovel turnings on a sale at \$34 to \$35.

Boston—Weaker prices for No. 2 bundles and borings and turnings mark the steel scrap price structure. Short shoveling turnings are included in the weakness. While steel scrap is moving steadily against old contracts, new buying is slow.

New York—Scrap brokers have dropped their prices on No. 2 heavy melting steel to \$32.50 to \$33.50 and on unstripped motor blocks to \$28, the latter being a sharp drop of more than \$4 a ton. All other prices are unchanged.

Buffalo—Weaker tendencies and lower prices dominate the scrap market here. Prices on No. 1 heavy melting dropped \$2 per ton while No. 2 heavy melting and No. 2 bundles slumped \$1.50. New business is reported at the lower prices.

Cleveland—With new mill purchases absent, and rejections against shipments on old contracts high, the market on steel scrap is showing signs of the jitters. Dealers fear a pile up of material in their yards unless the mills re-enter the market actively soon and ease up on their quality restrictions. Meanwhile, prices are tending downward sharply. In the absence of a representative mill purchase prices are nominal but, based on brokers' offers to dealers of \$39 on track for No. 1 heavy melting steel are lower. This brings the delivered price to mills to a range of \$41.50 to \$42.50, though brokers insist the former price range of \$44 to \$44.50 still prevails in the absence

(Turn to page 178)

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PRODUCTION
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GREY IRON
CASTINGS**

**ONE OF THE
NATION'S LARGEST
AND MOST MODERN
PRODUCTION
FOUNDRIES**

ESTABLISHED 1866

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- All Capacities

in inch ounces . . . inch pounds . . . foot pounds
(All Sizes from 0-6000 ft. lbs.)



Every manufacturer, design and production man should have this valuable data. Sent upon request.

PA. Sturtevant Co.
ADDISON, ILLINOIS

IRON AND STEEL SCRAP

Open market prices as reported to STEEL; gross tons, except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Apr. 9	\$43.33
Apr. 2	43.75
Mar. avg.	44.13
Apr., 1952	43.00
Apr., 1948	40.41

Based on No. 1 heavy melting
grade at Pittsburgh, Chicago and
eastern Pennsylvania.

PITTSBURGH

(Including brokers' commission)

No. 1 heavy melting	44.00*
No. 2 heavy melting	42.00*
No. 1 bundles	44.00*
No. 2 bundles	40.00*
No. 1 busheling	40.00*
Machine shop turnings	30.00-31.00*
Mixed borings, short turnings	32.00-33.00*
Short shovel turnings	34.00-35.00*
Cast iron borings	34.00-35.00*
Couplers, springs, wheels	50.00-51.00*
Heavy turnings	44.00*
Punchings & plate scrap	50.00-51.00*
Electric furnace bundles	46.00*

Cast Iron Grades

(Delivered)

No. 1 cupola	47.00-48.00
Charging box cast	44.00-45.00
Heavy breakable cast	43.00-44.00
Unstripped motor blocks	40.00-41.00
No. 1 machinery cast	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00
Rails, 2-ft. and under	57.00-58.00
Rails, 18-in. and under	58.00-59.00
Rails, random lengths	53.00-54.00
Railroad specialties	55.50-56.50

*Plus applicable freight spring-
boards from other areas.

CLEVELAND

(Delivered consumer plant; includ-
ing broker's commission)

No. 1 heavy melting	41.50-42.50*
No. 2 heavy melting	40.50-41.50*
No. 1 bundles	41.50-42.50*
No. 2 bundles	39.50-40.00*
No. 1 busheling	41.50-42.00*
Machine shop turnings	29.00-30.00*
Mixed borings, turnings	32.00-33.00*
Short shovel turnings	32.00-33.00*
Cast iron borings	32.00-33.00*
Low phos.	48.00-49.00*
Alloy free, short shovel turnings	36.00-37.00*
Electric furnace bundles	46.00-46.50*

Cast Iron Grades

(Delivered)

No. 1 cupola	47.00-48.00
Charging box cast	46.00-47.00
Heavy breakable cast	45.00-46.00
Unstripped motor blocks	43.00-44.00
No. 1 machinery cast	51.00-52.00

*Plus applicable freight spring-
boards from other areas.

DETROIT

(Delivered consumer plant; includ-
ing broker's commission)

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	37.50-38.00
No. 1 bundles	40.00-41.00
No. 2 bundles	34.50-35.00
No. 1 busheling	40.00-41.00
Machine shop turnings	24.50-25.00
Mixed borings, turnings	26.00-26.50
Short shovel turnings	26.00-26.50
Cast iron borings	26.00-26.50
Punchings & plate scrap	44.00-46.00

Cast Iron Grades

(Delivered)

No. 1 cupola	47.00
Charging box cast	40.00-42.00
Heavy breakable cast	37.50-38.00
Unstripped motor blocks	38.00-38.50
Brake shoes	40.00-41.00
Clean auto cast	52.00
Burnt cast	46.00-47.00
Drop broken machinery	49.00

*F.o.b. shipping point.

RAILROAD SCRAP

(Delivered)

No. 1 R.R. heavy melt.	46.00-47.00
Malleable	49.00-50.00
Rails, 18-in. and under	59.00-60.00
Rails, random lengths	51.00
Rails, rerolling	52.00

*Plus applicable freight spring-
boards from other areas.

BOSTON

(Delivered consumer plant; includ-
ing broker's commission)

No. 1 heavy melting	41.50-42.00*
No. 2 heavy melting	40.50-41.00*
No. 1 bundles	41.50-42.00*
No. 2 bundles	39.50-40.00*
Machine shop turnings	29.00-30.00*
Short shovel turnings	32.00-33.00*
Cast iron borings	32.00-33.00*
Low phos.	48.00-49.00*
Electric furnace bundles	47.00-47.50*

RAILROAD SCRAP

(Delivered)

No. 1 R.R. heavy melt.	46.00-47.00
------------------------	-------------

*Plus applicable freight spring-
boards from other districts. Prices
on steel grades are nominal.

NEW YORK

(Brokers' Buying Prices)

No. 1 heavy melting	37.00
Machine shop turnings	24.00
Mixed borings, short turnings	27.00-28.00
Low phos. (structural & plate)	40.00-40.50
Shovel turnings	27.00-28.00

Cast Iron Grades

(Delivered consumer plant)

No. 1 cupola	39.00-40.00
Unstripped motor blocks	28.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	44.00-45.00
No. 2 heavy melting	40.00-41.00
No. 1 bundles	44.00
No. 2 bundles	40.00
No. 1 busheling	40.00
Machine shop turnings	31.50-32.00
Mixed borings, turnings	35.00-36.00
Short shovel turnings	36.00-37.00
Structural & Plate	47.50-48.50
Heavy turnings	42.50-43.50
Couplers, springs, wheels	52.00

Cast Iron Grades

(Delivered consumer plant)

No. 1 cupola	43.00-45.00
Stove plate	38.00-40.00
Unstripped motor blocks	38.00-40.00
Clean auto cast	48.00-50.00
Drop broken machinery	46.00-48.00

RAILROAD SCRAP

(Delivered consumer plant)

No. 1 R.R. heavy melt.	46.00-48.00
Malleable	45.00-47.00
Rails, 2-ft. and under	55.00-57.00
Rails, 18-in. and under	57.00-59.00
Rails, random lengths	53.00-54.00
Rails, rerolling	55.00

Cast Iron Grades

(Delivered consumer plant)

No. 1 cupola	42.00-43.00
Stove plate	43.00-44.00
Unstripped motor blocks	33.00
Clean auto cast	50.00
Burnt cast	44.00
Drop broken machinery	48.00

CINCINNATI

(Delivered consumer plant)

No. 1 heavy melting	43.00-44.00
Charging box cast	45.00
Heavy breakable cast	45.00
Unstripped motor blocks	33.00-34.00
Drop broken machinery	49.00-50.00

RAILROAD SCRAP

(Delivered consumer plant)

No. 1 R.R. heavy melt.	46.00-47.00
Malleable	49.00-50.00
Rails, 18-in. and under	59.00-60.00
Rails, random lengths	59.00-60.00
Rails, rerolling	52.00

Cast Iron Grades

(Delivered consumer plant)

No. 1 cupola	45.00-46.00
Charging box cast	39.00-41.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	33.00-35.00
Brake shoes	41.00
Clean auto cast	46.00-47.00
Burnt cast	37.00-39.00

CAST IRON GRADES

(F.O.B. Shipping Point)

No. 1 heavy melting	39.00
No. 2 heavy melting	39.00
No. 1 bundles	40.00
No. 2 bundles	37.00
Machine shop turnings	27.00-28.00
Short shovel turnings	29.00-30.00

CAST IRON GRADES

(F.O.B. Shipping Point)

No. 1 cupola	42.00-43.00
Stove plate	43.00-44.00
Unstripped motor blocks	33.00
Clean auto cast	50.00
Burnt cast	44.00
Drop broken machinery	48.00

RAILROAD SCRAP

(F.O.B. Shipping Point)

No. 1 R.R. heavy melt.	46.00-47.00
Malleable	49.00-50.00
Rails, 18-in. and under	58.00-60.00
Rails, random lengths	58.00-60.00
Rails, rerolling	52.00

Cast Iron Grades

(F.O.B. Shipping Point)

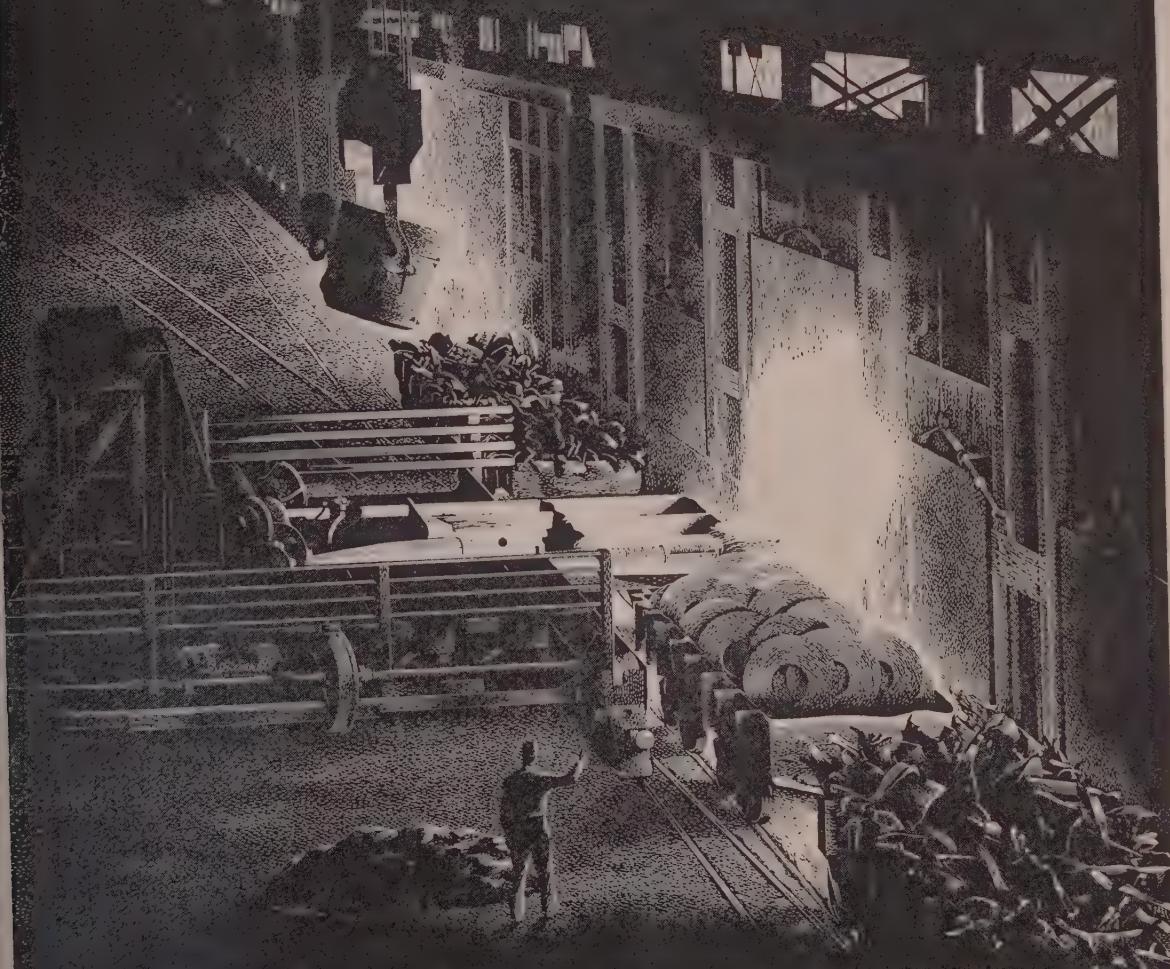
No. 1 cupola	42.00-43.00
Stove plate	43.00-44.00
Unstripped motor blocks	33.00
Clean auto cast	50.00
Burnt cast	44.00
Drop broken machinery	48.00

RAILROAD SCRAP

(F.O.B. Shipping Point)

No. 1 R.R. heavy melt.	46.00-47.00
Malleable	49.00-50.00
Rails, 18-in. and under	58.00-60.00
Rails, random lengths	58.00-60.00
Rails, rerolling	52

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CHICAGO, ILLINOIS. LEBANON, PENNA. PUEBLO, COLORADO SEATTLE, WASH.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Scrap . . .

(Continued from page 175)

of a firm buy.

Detroit—Orders for turnings are tending to cushion the drop anticipated in prices, but a decline to around \$20 is expected about May 1. Mills are more critical of scrap received.

Youngstown—Some large scrap consumers are back in the market in a small way but they are replenishing inventories with a watchful eye on the price trend.

Cincinnati—Trading is quiet. Demand has weakened and supplies are adequate in all grades. Since the mills have done most of their buying for the next 30 days, no fluctuation in prices is anticipated for the next week or so.

Chicago—Top grades of open-hearth scrap like No. 1 heavy melting and No. 1 bundles enjoy good demand but most other grades are sluggish. Dealers' stocks are increasing as outlying areas ship promptly under the influence of a sagging price trend. Recent purchase by an important mill has established lower prices on turnings. Machine shop turnings were bought for \$25, delivered, including commission, and short shoveling turnings for \$27. The former is down \$2 to \$3 and the latter \$1 to \$2. Scrap inventories are substantial despite heavy consumption.

St. Louis—Scrap buying by mills started cautiously last week, the first new orders since decontrol being placed.

San Francisco—No. 1 cupola cast, reflecting something of a scarcity, moved up slightly to \$38 a ton delivered last week. Steel grades continue unchanged with deliveries slow.

Seattle—The scrap market advanced \$3 per ton last week. According to the leading buyer, No. 1 heavy melting steel increased from \$30 to \$33.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2400 tons, Washington state Chehalis river bascule span, to Pacific Car & Foundry Co., Seattle; MacRae Bros., Seattle, general contractors, low \$3,364,025.

795 tons, Hickory Creek bridge, railroad relocation, Denton county, Tex., Corps of Engineers, to Maxwell Steel Co., Ft. Worth, Tex.; Austin Bridge Co., Dallas, general contractor; also 725 tons, H-bearing piles

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an operating cycle of rapid approach, feed,
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Will accommodate work 30" in diameter.

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column machine with six four spindle mul-
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to Tennessee Coal & Iron Division, U. S. Steel Corp., and 65 tons, reinforcing bars to Southern States Steel Co., Dallas, Tex. 600 tons, New York state thruway, bridge, Albany county, New York, to Ernst Iron Works, Buffalo; D. V. Frieone & Co., New Haven, Conn., general contractor.

550 tons, partial requirements, terminal market, Boston, to Grossier & Schlager Iron Works, Somerville, Mass.

533 tons, warehouse, U. S. armory, Springfield, Mass., to Haarmann Structural Steel Co., Holyoke, Mass.; E. F. Carlson Co., Springfield, general contractor.

350 tons, maintenance hangar, naval air station, Key West, Fla., to B. L. Montague, Sumter, S. C.; Henry C. Beck Co., Atlanta, Ga., general contractor.

250 tons, two maintenance shops, Ladd air field, Alaska, to Leckenby Structural Steel Co., Seattle; Grove, Shepherd, Wilson & Kruse Inc., Seattle, general contractor.

125 tons, steel decking, Chehalis river state span, to M. M. Mossman, Seattle, for Reliance Steel Products Co., McKeesport, Pa.

125 tons, 2-span rolled beam bridge with overall skew span, Wilton-Redding, Conn., to American Bridge Division, U. S. Steel Corp., Pittsburgh; Mariam Construction Co., New Haven, general contractor.

100 tons, 100-ton traveling crane for Dexter dam, Oregon, to Cyclops Iron Works, San Francisco, low \$88,512, by U. S. Engineer, Portland, Oreg.

STRUCTURAL STEEL PENDING

4000 tons, bridge, District of Columbia Commission, Washington; bids open Apr. 9, following a postponement; approximately 1000 tons of affiliated work will be up for bids later.

3000 tons, plant for Anaconda Aluminum Co., Flathead, Mont.; bids in.

2500 tons, addition to state hospital, Philadelphia, opening of bids postponed until May 6.

1500 tons, state highway bridge, York county, Pennsylvania, bids Apr. 24.

1200 tons, state highway bridge, Penobscot river, Bangor-Brewer, Me.; bids Apr. 29, Maine State Highway Commission, Augusta, Me.

490 tons, 385-foot, 3-span riveted plate girder bridge, Shetucket river, relocation route 12, Norwich, Conn.; bids Apr. 20, Hartford, Conn.

465 tons, Snake river plate girder bridge; bids to Bureau of Reclamation, Denver, May or June.

350 tons, police station, Hartford, Conn.; Southern New England Construction Co., Hartford, low.

400 tons, hoisting machinery, Lucky Peak dam; Moffit Engineering Co., Albany, Calif., low \$99,400, to U. S. Engineer, Walla Walla, Wash.

160 tons, bridge, Manchester, N. H.; Harvey Construction Co., Manchester, low.

110 tons, shop addition, Bullard Co., Bridgeport, Conn.

100 tons, draft tube gantry crane, Chief Joseph dam powerhouse; Star Iron & Steel Co., Tacoma, low \$42,930, to U. S. Engineer, Seattle.

100 tons, penstock, stoplogs, etc., Lookout Point dam, Oregon; Weldrite Steel Co., Inc., Bellingham, Wash., apparently low \$43,171 to U. S. Engineer, Portland.

100 tons, three seal radial gates, Tiber dam, Montana; bids to Denver Apr. 28.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, municipal stadium, Baltimore, to Bethlehem Steel Co.

600 tons, bars and mesh, highway and culverts, Wilbur Cross highway, route 15, Connecticut, to Plantations Steel Co., Providence, R. I., and Wickwire-Spenner Division, Colorado Fuel & Iron Corp., New York; M. A. Gammino Construction Co., Providence, general contractor.

495 tons, Washington state Fox Island bridge, to Bethlehem Pacific Coast Steel Corp., Seattle; Manson Construction & Engineering Co., Seattle, general contractor.

300 tons, maintenance hangar, air field base, Key West, Fla., to Virginia Steel Co., Birmingham, Ala.; Henry C. Beck Co., Atlanta, Ga., general contractor.

330 tons, training school, U. S. Engineers Ft. Holabird, Md., to Capitol Steel Corp. of New York, Brooklyn, N. Y. 235 tons, addition, fire control unit, Aberdeen, Md., to Capitol Steel Corp. of New York, Brooklyn, N. Y. 200 tons, laboratory, Camp Deitch, Md., to Capitol Steel Corp. of New York, Brooklyn, N. Y. 125 tons, Holy Trinity school and convent, Glenburnie, Md., to Bethlehem Steel Co.

REINFORCING BARS PENDING

20,000 tons, estimated, bars and piling, substructure, Straits of Mackinac bridge, Michigan, Merritt-Chapman & Scott Corp., New York, general contractor.

563 tons, substructure, Sakonnet river bridge, Portsmouth-Tiverton, R. I.; Whaling City Dredge & Dock Corp., Grotton, Conn., low.

175 tons, 110-mile canal laterals, Columbia Basin project; bids to Bureau of Reclamation, Denver, late April.

150 tons, various Washington state highway projects; bids in.

116 tons, state garden parkway, contract N 11, section 10, Burlington and Ocean counties, New Jersey; bids opened by State Highway Authority, Trenton, Apr. 23.

110 tons, Snake river bridge, Pallsades project; bids to Bureau of Reclamation, Denver, May or June.

PLATES . . .

PLATES PLACED

450 tons, municipal water storage tank, Joseph, Mo., to Hammond Iron Works, Warren, Pa.

100 tons plus, supplementary contract for plant tanks, Ketchikan Pulp Co., Alaska, Chicago Bridge & Iron Co., Chicago.

PIPE . . .

CAST IRON PIPE PLACED

450 tons, Water District No. 42, Seattle, H. G. Purcell, Seattle, for U. S. Pipe Foundry Co., Burlington, N. J.

100 tons, system improvement, Moses Lake Wash., to Pacific States Cast Iron Pipe Co., Seattle; Shoreline Construction Co., general contractor.

CAST IRON PIPE PENDING

418 tons, 20 inch, system expansion; bids Bellingham, Wash., Apr. 6.

350 tons, 25,000 feet plus, 12 to 4 in., all fittings; bids, also alternatives, to W. Crook, city clerk, Renton, Wash., Apr. 1.

STEEL PIPE PENDING

500 tons (estimated), 16,000 feet 24 to 12 water mains; bids to K. B. Moss, clerk, Walla Walla, Wash., Apr. 8.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Central of Georgia, one 1500-hp diesel road switcher, to Electro Motive Division, General Motors Corp., La Grange, Ill.

Chicago Burlington & Quincy, 33 diesel units to Electro Motive Division, General Motors Corp., La Grange, Ill.; list comprises for two-unit 4500-hp passenger locomotives and five two-unit 3000-hp and fifteen 1500-hp road switchers.

Detroit, Toledo & Ironton, two 1500-hp general purpose diesel engines, to Electro Motive Division, General Motors Corp., La Grange, Ill.

Illinois Central, 37 diesel units, comprising thirty-five 1500-hp road switchers and twenty 2200-hp passenger units, to Electro Motive Division, General Motors Corp., La Grange, Ill.

Mississippi Central, ten 1200-hp diesel switchers, to Electro Motive Division, General Motors Corp., La Grange, Ill.

Union Pacific, ten 1500-hp diesel electric road switching units, to Electro Motive Division, General Motors Corp., La Grange, Ill.

RAILROAD CARS PLACED

Norfolk & Western, 1000 seventy-ton gondolas, to open shops at Roanoke, Va. E. S. Smser & Lake Erie, 200 seventy-ton gondolas, to Greenville Steel Car Co., Greenville, Pa.

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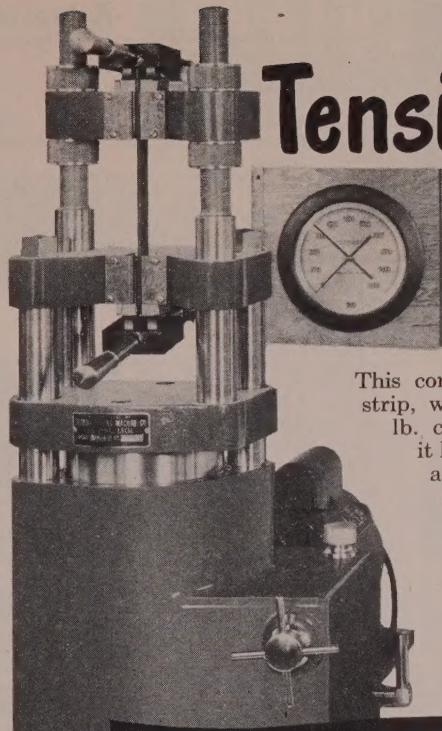
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Easy!

This compact machine tests spotwelds, strip, wire, anything within its 20,000 lb. capacity. Hydraulically powered, it has an easily controlled ram, self-acting specimen grips that are open sided for easy specimen insertion. This tester, Model ST-1, is adjustable to take specimens 5" to 9" in length. Various load gauges, grips, and other modifications are available.

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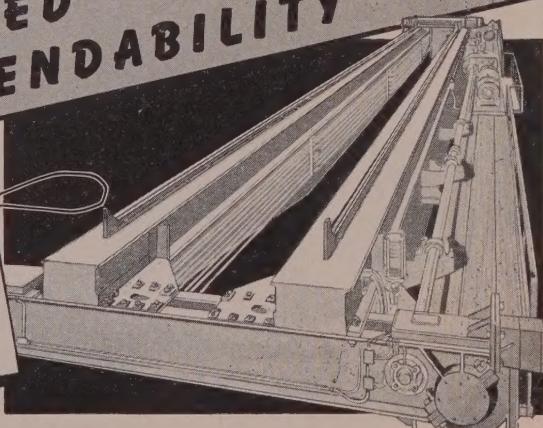
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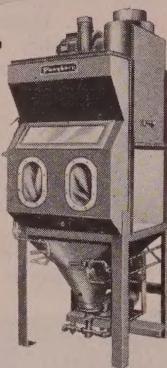
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PANGBORN SPEEDS UP PRODUCTION, LOWERS COST

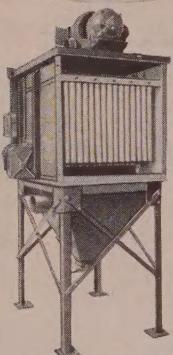
WITH PRECISION
FINISHING . . .

Pangborn Hydro-Finish Cabinet—Removes scale and directional grinding lines . . . holds tolerances to .0001" and prepares surfaces for painting or plating. Liquid blast reduces costly hand cleaning and finishing of molds, dies, tools, etc. Models from . . . \$1410 and up.



AND DUST CONTROL

Pangborn Unit Dust Collector—Traps dust at the source. Machine wear and tear is minimized, housekeeping and maintenance costs reduced. Solves many grinding and polishing nuisances and allows reclamation of valuable material. Models from . . . \$286 and up.



Pangborn Blast Cleaning Machines for cleaning tanks, bridges, structures quickly and economically. Portable and stationary models, 6 sizes . . . \$187 and up. Cabinet for cleaning small metal parts better and faster . . . \$319 and up.

Write for details on these machines to: PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md.

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment

Pangborn

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Rockford Screw Products Co.
Roebing's, John A., Sons Corporation
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Yoder Co., The

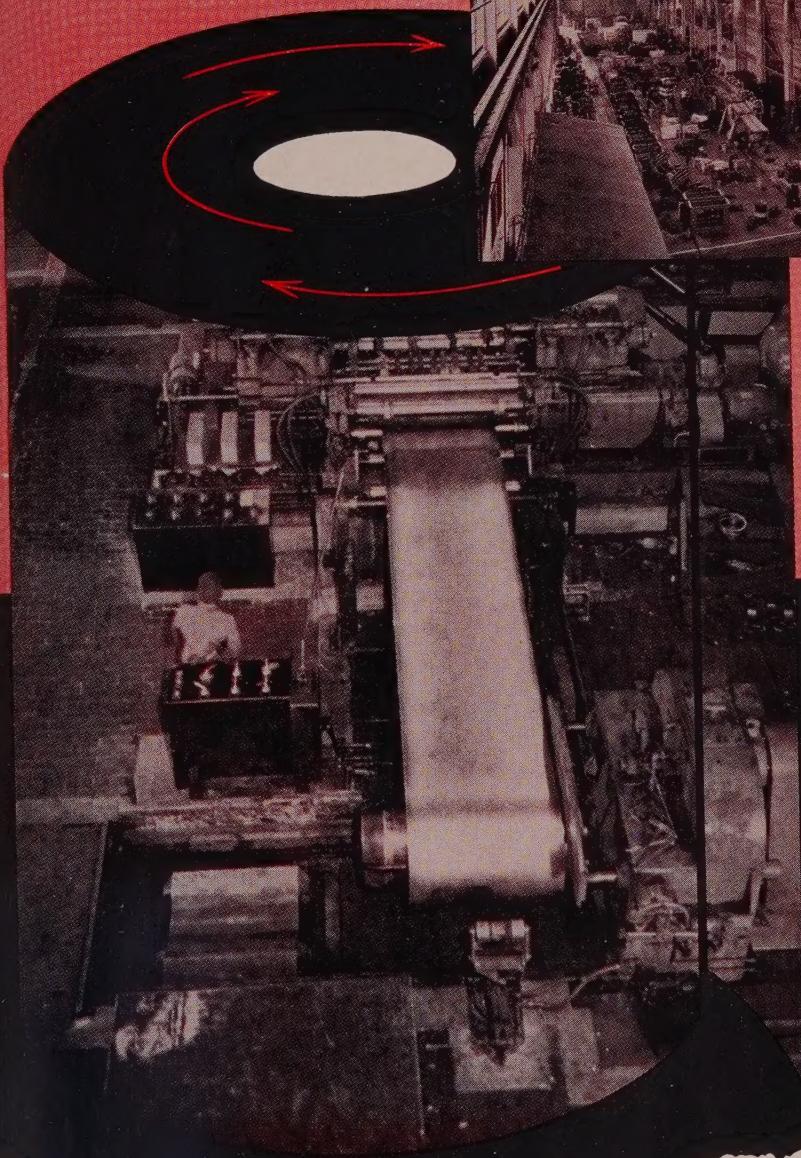
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ENGINEERING

COMPANY



Leading Engineers
and Builders
of

FLAT-ROLLED FINISHING EQUIPMENT

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aetna-standard

E AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

ts in Warren, Ohio • Ellwood City, Pennsylvania

Holds world's record of 214,842 tons in 31 days... with help of TIMKEN® bearings

THIS United Engineering slab-bing mill recently set a world's record at U. S. Steel's Homestead plant by producing 214,842 net tons of steel slabs in 31 days. Timken® bearings on the roll necks helped reduce time-outs for repair and maintenance to a minimum, insured long, trouble-free performance.

The balanced proportion design of Timken bearings provides maxi-

mum bearing capacity in a given space. Load ratings are increased up to 40%, roll neck strength 50 to 60%.

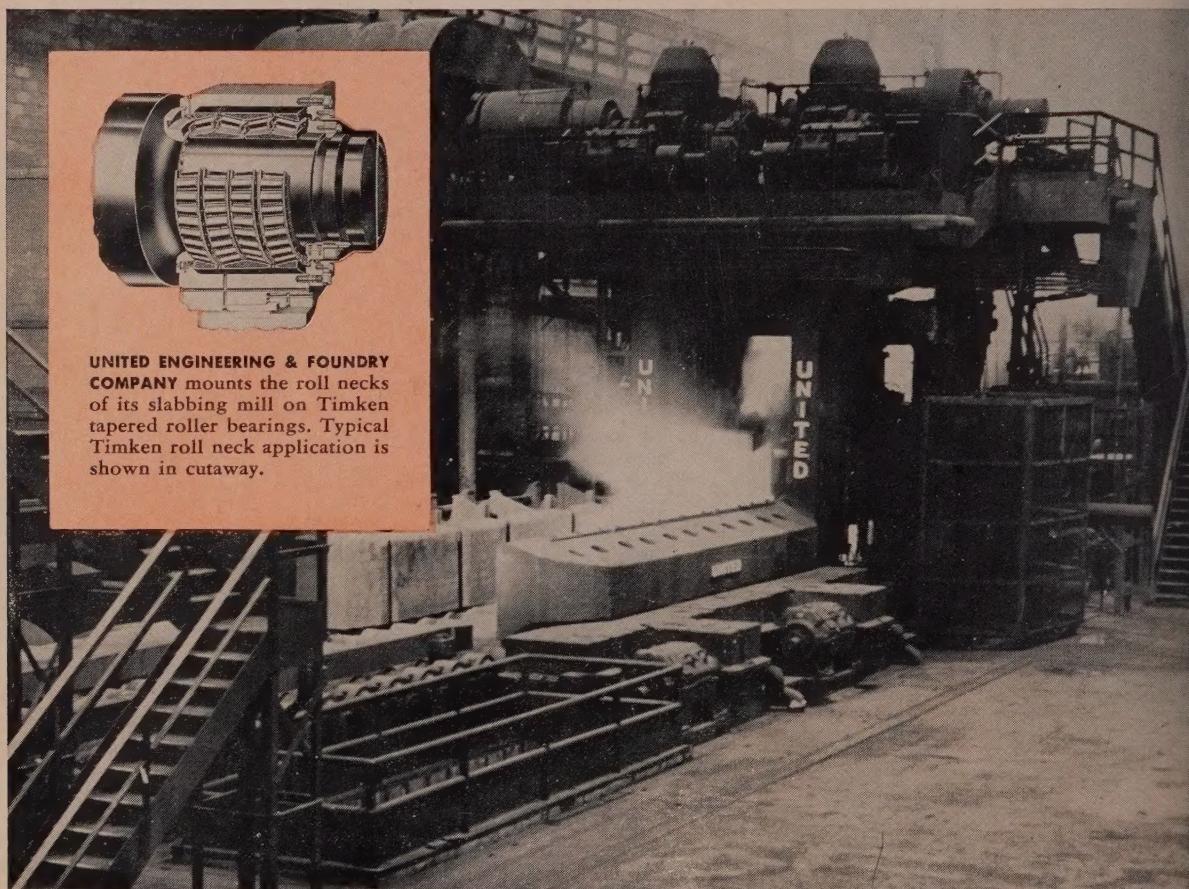
Timken tapered roller bearings give you greater mill rigidity, permit larger diameter roll necks. Costly and complicated lubrication systems are eliminated.

And because they take radial and thrust loads in any combination, no special thrust bearings are needed.

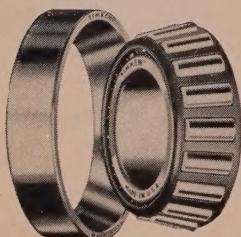
Years of research and development by The Timken Company have resulted in many improvements in roll neck bearing design and performance. For further information write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



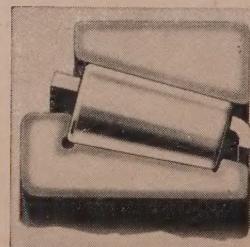
This symbol on a product means its bearings are the best.



UNITED ENGINEERING & FOUNDRY COMPANY mounts the roll necks of its slabbing mill on Timken tapered roller bearings. Typical Timken roll neck application is shown in cutaway.



TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface and a tough, shock-resisting core. Result: longer bearing life.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.